COAL AGE

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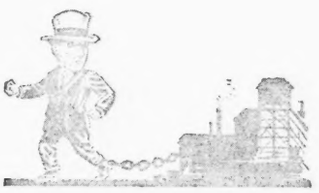
The Men Who Come Back

We recently saw a diagram of the components of management. It was arranged like this:

At such a time they don't ask for a position, but for a job.

Men
Money
Markets
Materials
Methods
Machines
} Management



Many a man owes his success to the fact that he was forced to stick to his line of work.

ALL of these factors can be understood and in some measure perfected except the first, which is by far the most important. You may have money, markets, materials, methods and machines, but you can't have management unless there are men to manage. The man who arranged this diagram was right in putting men at the top; and this led us to do some thinking about men and especially about the MEN WHO COME BACK.

It is said to be a fact, as proven by carefully gathered statistics covering many thousands of applicants for work, that not more than one in twelve persons knows what he can do or wants to do, and of those who do know what they can do, about 90 per cent. want to do something else.

From this latter class are recruited the men who come back. They are the fellows who, you will recall, made first-class miners, rockmen, motormen, foremen or managers as long as they stuck to the job, but who could not resist the desire for change and chucked the steady job for a fling at something else. Maybe they stayed away for only a few months or maybe they managed to get along for several years. But as near as you can remember, didn't most of them come back and ask for a job?

Certainly the facts will prove that most of those who leave finally come back, and even a former manager at such a time doesn't ask so much for a position as for a job. More than one successful mine superintendent, manager or president will give you as one reason for success the fact that he was forced to stick to his line of work by seeing the number of men who failed at new things and came back glad to get anything and with a small chance then to turn failure to success.

Are you doing pretty good at your work? Have you got a chance where you are to go higher and earn more? Then stay at the job. Even if you don't feel that way about it, don't make a change unless you know for sure that the new work is best for you. Don't run the chance of getting in the class of those who come back. Remember they don't come back to take a new departure as the conquering legions returned to ancient Rome, knowing they would set out afresh to achieve new victories; but they come back to take whatever may be offered them.

If you will keep your eyes on the MEN WHO COME BACK, you will be able to free yourself of that longing to leave your steady job and regular salary to try something new.

Just remember this: They are always coming back.

Ideas and Suggestions

Grinding the Commutator

By C. J. Fuetter*

Any electrician knows the trouble encountered when a generator or motor needs the commutator turned down, but which is so located or is too heavy to be taken to a lathe and there is no turning tool on the job that can be attached to the generator or motor frame.

In such a case I have used a sandstone to grind commutators or generators, tipple motors, fan motors and even mining-machine motors, with good results. Any size stone will do as long as it can be held between the brush holders and is so shaped as to bear evenly on the commutator. Of course the man doing the work must remember that safety is the first consideration, and also use some judgment so as to get an even surface the whole width of the commutator.

If the sandstone is applied as soon as the commutator shows signs of uneven wear, it will save the electrician a lot of trouble. Sometimes a commutator will spark and heat badly on account of the mica not wearing down as fast as the copper; but for some cause it is not desirable to cut this down with a three-cornered file. A good sandstone held against the commutator for a few minutes will grind down the mica even with the commutator bars, and this will stop the sparking and consequently the heating.

Coal-Mine Research

By J. F. K. Brown†

Has any large coal company ever considered and tried out the idea of instituting a research department as a regular branch of its daily work? There are possibilities in the suggestion.

Consider the case of the 5,000,000-ton yearly producer and imagine that the expense of running such a department rose to $10,000 annually. But also suppose that the work carried on was successful in effecting a saving of one-quarter of a cent per ton, it can then be seen that it would require just a little over a year for such a department to be self-supporting, and every suggestion that thereafter emanated therefrom would represent clear profit to the operators.

Research the Complement of Efficiency

Research is the natural complement of efficiency. Efficiency engineering deals with the continued improvement of present conditions, but must be hampered by the want of means to continue the inquiries instituted into the requirements of the future. Efficiency aided by research would be equipped to deal with conditions and methods that are matters of yet some years ahead. The work would mean the establishment of a laboratory, together with the maintenance of an experimental mine. The laboratory would naturally be equipped with both mechanical and chemical appliances and be capable of proper attention to both these subjects and their allied sciences. This is necessary because of the varied work that must be undertaken.

The experimental mine is a necessary adjunct to the laboratory, as it is a place where results deduced from the laboratory work can be subjected to mining conditions before being imported into the actual mining operations on a large scale. Most coal areas contain a number of old slopes and shafts whose days of usefulness in the field is past; and instead of these being abandoned and allowed to fill up with water, the cost of keeping them open, together with a few roads and perhaps a small area of pillar coal to work on—in general, their conversion to the purposes of research—would be more than repaid by the results that would accrue to the other and more modern mines of the district. Such a small plant could also be used as a training station when the need for the introduction of hitherto unknown machinery or methods became imperative. In mining, the success of many changes in ways and means depends a great deal on the ability, education and interest of the "noncommissioned officers" of the mine—the deputies, firemen and pitbosses.

Most Every Department Could Be Improved

The work that could be done and through which profit could be derived from research and experiment is as varied as is the actual operation of the mine. There is hardly any department that could not be improved in the course of a study of its requirements and its conditions. The type, class and standardization of the timber supplies, the advantages and disadvantages of steel substitutes, the proper uses of oils and greases, ropes and supplies generally, might all be investigated.

In this latter respect the laboratory becomes an aid to the purchasing department. The testing and trying out of various types of underground machines, settling on a suitable type, etc., is all part of the work that may be first tried out in the experimental mine. The testing of pumps, the effect of corrosive water and its cure, the efficiency of systems of operation and the working out of the data necessary to all the many details that go to make the successful running of a coal mine are all matters that may be studied to advantage in a small mine devoted to such research.

Gas testing, efficiency of underground lighting systems and problems in ventilation are subjects deserving careful study. There is also the important question of the production of a clean and more salable product.

The ideas that might be tested out and the products and supplies that might be standardized and arranged in a large company are endless, and considering the cost of carrying through this work, the laboratory and the experimental mine would seem to offer much scope for future success. Why leave this work to individual effort, and in doing so pat yourself on the back as being conservative, safe and cautious? Is it not possible for a coal company to suggest many of the improvements that could

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take place instead of leaving them to the enterprise, say, of a few machinery manufacturers whose efforts are at first laughed at, only to be adopted later after a 5 or 10 years' fight for introduction. Surely the mine manager has a greater experience to draw on than the manufacturer who has to design material for work concerning which his knowledge is small. Research work need not be confined to actual operations around the particular mine where the laboratory is established. On the contrary, use should be made of a certain part of the time to travel and absorb ideas and suggestions from other fields. The brains of the mining industry do not all lie in one locality, as many operators are apt to think. Such of these ideas as appear feasible for transplanting should be tested out in the experimental mine. The suggestion of research work is analogous to the work carried on by some of the larger steel plants; and while the benefits that accrue from that work are not always apparent to even the men inside the plant, such research has been responsible for a great deal of the advance that has been made in the steel industry in recent years. Mining men can accomplish equally as much.

DAILY REPORT OF SHAFT DEVELOPMENT Lehigh MINE Thurs. DAY Feb. 5 1915

SHIFT BOSS	SHIFT # 1					SHIFT # 2					SHIFT # 3					TOTAL				
DATE	Feet Sunk	Feet Drilled	Buckets Hoisted	Sets Placed	Material Used	Feet Sunk	Feet Drilled	Buckets Hoisted	Sets Placed	Material Used	Feet Sunk	Feet Drilled	Buckets Hoisted	Sets Placed	Material Used	Feet Sunk	Feet Drilled	Buckets Hoisted	Sets Placed	Material Used
Sunday																				
Monday																				
Tuesday																				
Wednesday																				
Thursday	—	110	6	—	22x 33p	—	—	—	1	——	1	0	56	—	——	1	110	62	1	22x 33p
Friday																				
Saturday																				
TOTAL FOR WEEK																				
PREVIOUS WEEKS																				
TOTAL FOR MONTH																				
PREVIOUS MONTHS																				
TOTAL																				

REMARKS 1st Shift lowered part of track set and put 1 section of Stairway in Place 2nd shift sent down balance of Steel set and put it in Placed, braced up & lagged it 3rd Shift took out staging and worked on bottom

TOTAL DEPTH OF SHAFT BELOW COLLAR 126ft TOTAL DEPTH TIMBERED 120ft

TEMPERATURE AT 7 A. M. 15° below WEATHER CONDITIONS Cold

REMARKS The weather being so cold it freezes up the muck in the pits, also in the muck cars I am using a steam point with a great deal of success during the cold weather. The temperature last night was 30 deg. below zero. J. W. Powell, Supt.

DAILY LABOR STATEMENT Thurs. DAY Feb 5. 1914

LABOR CLASSIFICATION	SHIFT # 1 NO.	SHIFT # 1 AMOUNT	SHIFT # 2 NO.	SHIFT # 2 AMOUNT	SHIFT # 3 NO.	SHIFT # 3 AMOUNT	TOTAL NO.	TOTAL AMOUNT	RATE
SHIFT BOSS	1	$8 00	1	$8 00	1	$8 00	3	$24 00	$8 00
SHAFTMEN	6	24 00	1	2 8 00	8	32 00	21	84 00	4 00
LANDERS AND DUMPMEN	X		1	3 15	1	3 15	2	6 30	3 15
Eng. Dump	1	3 15	1	3 15	1	3 15	3	9 45	3 15
ENGINEERS	1	4 00	1	4 00	1	4 00	3	12 00	4 00
FIREMEN	1	3 35	1	3 35	1	3 35	3	10 05	3 35
PUMPMEN	1	3 75	1	3 75	1	3 75	3	11 25	3 75
P.PEMEN	1	3 75					1	3 75	3 75
MASTER MECHANIC	1	4 25					1	4 25	4 25
BLACKSMITHS	1	4 00					1	4 00	4 00
BLACKSMITH HELPERS	1	3 00					1	3 00	3 00
CARPENTER FOREMAN	1	4 80					1	4 80	4 80
CARPENTERS	1	3 90					1	3 90	3 90
SURFACE FOREMAN									
GENERAL SURFACE LABORERS	7	20 30					7	20 30	2 90
TEAMSTERS	1	3 15					1	3 15	3 15
OFFICEMEN									
TOTAL	25	$91 10	13	$80 40	14	$54 40	52	$194 90	

ACCIDENTS None

FRONT AND BACK OF REPORT FORM

Report for Shaft Sinking

BY J. W. POWELL*

The accompanying illustration is a sample of a report form that was used by the Cottonwood Coal Co., which is a subsidiary company of the Great Northern Railroad Co. during the shaft-sinking operations at Lehigh, Mont., where a five-compartment shaft was sunk, tapping a 13-ft. bed of semibituminous coal. This is one of the most modern and uptodate shafts in the West. Its dimensions are 31x9 ft. inside of the steel. It is supported throughout by channel steel, which is used as end plates, side plates, and buntons. Material used for lagging was 3x12-in. fir, while the 8x8-in. punch posts were of the same material, all of which was thoroughly treated with a creosote mixture. As I was in charge of this work as superintendent of shaft-sinking operations, I can vouch that the report proved to be satisfactory to the management. This form was made out in triplicate—one was forwarded to the president of the company, Casmi A. Thompson, Great Northern Building, St. Paul; one to the general manager, James Pearson, Stockett, Mont., and one was kept on file by the superintendent. These reports could with some modification be made to apply to any class of work, such as rock tunnels, slopes or any preliminary or exploration work. The crossmark in the report denotes exploders or detonators, while the letter P denotes pounds of dynamite.

*Delagua, Colo.

There Are Two Secrets of Success—First, self-trust, and second, constancy of purpose. Exceptional intellectual ability is not needed to secure success. Average men run our mines just as they do the business affairs of the entire world. The Apr. 1 issue of "Coal Age" will be our annual Success Number. We want 100 of our readers to write 100 short articles covering 100 instances of Success in coal mining as attained by men, methods and machines. Every article will be paid for at a liberal rate, and all the manuscripts will be handled in the order of their receipt. Those that are acceptable for publication but come in after all the available pages have been utilized will be printed in subsequent issues. The Success Number, however, is the issue we want your article to appear in, so get busy today and have your copy in our hands next week.

FIG. 1. HYDRAULICKING SOIL AND GLACIAL DRIFT FROM THE SHALE OVERLYING THE COAL AT THE PLANT OF THE WESTERN BRICK CO.

Steam-Shovel Coal Stripping in the Danville District

SYNOPSIS—In the vicinity of Danville, Ill., many of the problems incident to adapting the steam shovel to coal stripping have been worked out. Within a comparatively small area several different types of machines have been tried. At the present time the full-revolving long-boom shovel practically holds a monopoly of this field.

Although the steam shovel is one of the later developments in mining appliances, it has rapidly come to the front as an economical means of securing large outputs at a small cost. Modern steam-shovel mining practically had its birth in the development of the Mesabi iron deposits about 1892, but since that time great strides have been made in the design and size of the shovels.

Much has been written concerning the giant shovels working on the Panama Canal, but the general public, and in fact many of the engineering fraternity, do not realize that shovels of equal or even greater capacity are daily at work digging iron, copper, coal and shale and that the development of the large size revolving shovel within the past decade has been due to the necessities of coal stripping.

Great improvements have been made in the steam shovel within the past 10 or 15 years in order to adapt it to the service demanded in digging at the face or in removing overburden; for since the shovel is the one element upon which the operation of an entire open pit depends, no chances can be taken in its construction if the plant is to operate continuously. Many of these improvements have been made to meet the conditions existing in the Danville district in eastern-central Illinois.

The most extensive steam-shovel mining operations in the United States are undoubtedly the Mesabi iron mines of Minnesota and the copper mines of the Rocky Mountains; but although less extensive, yet of equal interest and of growing commercial importance are the bituminous coal strippings and shale mines that are located mainly in the Middle West in or near the Mississippi Valley.

The deposits of bituminous coal that are suitable for stripping are of three kinds: 1. Those that outcrop and dip at a small angle so that cover is gained slowly; the strippings of southern Illinois are of this type. 2. Those where much of the formation above the coal has been eroded by glaciation or other means, so that the coal bed is near the surface, with only a limited amount of overburden near the outcrop between the coal bed and the surface. 3. Those located in sections where the coal is ordinarily too deep for stripping, but where in certain erosion valleys the overlying rock has been removed in times past, leaving a flat valley surrounded by hills, and with the coal in this depression lying only a short distance below the present valley floor. This condition renders steam-shovel mining possible near Danville, Ill. When such conditions prevail, the stripping areas are limited in extent and in most cases the stripped areas are connected with underground mines where the coal goes under the hills surrounding the flat where the stripping is done.

The conditions that render stripping possible in anthracite mining are seldom encountered in connection with bituminous deposits. These include steeply inclined, thick outcropping deposits, such as the thick anticlines of the Mammoth seam.

In the Danville district stripping is carried on (a) to obtain the coal alone, the overlying shale either being unfit for brickmaking or being wasted for lack of suitable means for its utilization; (b) to obtain the shale that is above the coal, or in some instances that which is below it, for use in brickmaking. The coal near the shale may or may not be recovered, though it usually is.

Not only are various methods of stripping to be seen within the comparatively small area of the Danville district, but nearly every known method of handling the

spoil is used at the various mines. There are also several combinations of strip and underground mines in the same locality; hence there is probably no better place in the United States to study coal stripping than in an area of a few square miles situated south and west of the City of Danville, where there are now operating five large strippings employing some of the largest shovels in the world.

The coal bed generally being stripped is the No. 7 of the Illinois Geological Survey and varies within this district from 2½ to 6½ ft. in thickness, but where stripping is being carried on, it is usually 5 to 6 ft. thick. The No. 7 coal usually contains more impurities than the No. 6 below it, and usually has two benches separated by a 1-in. clay band that occurs 6 to 8 in. above the floor. An analysis of the No. 7 coal by Prof. S. W. Parr, of the University of Illinois, gives the following composition in percentages: Volatile matter, 44.01; fixed carbon, 44.53; ash, 8.10; sulphur, 3.37; heat content, dry coal, 12,807 B.t.u.; heat content per pound of combustible, 14,740 B.t.u.

This analysis shows a grade of coal which is not of the highest, but owing to the cheap stripping methods, it is a fuel for which there is a ready market. The No. 6 or Grape Creek seam is being stripped at the No. 3 plant of the Western Brick Co., where the loose top or surface material is wasted and the underlying fire clay, shale and sandstone are being used for brickmaking.

One of the earliest bituminous coalfields in the United States to be worked by the stripping method was the Mission Field near Danville, and not only is this field thus of historic interest, but in connection with it and other Danville strippings, many of the steam-shovel problems in connection with coal mining have been successfully worked out.

From 1866 to 1886 stripping in the Danville region was done in a small way by team scrapers, but between 1885 and 1888, the exact date not being known, the Consolidated Coal Co., of St. Louis, contracted to have steam-shovel stripping done by a firm of Lafayette, Ind., drainage contractors. This company decided that the ordinary contractors' shovel then in use, with a dipper of ¾ to 1½ cu.yd. capacity, was not suited to the purpose, so it built from designs of one of its engineers three dredges on wheels patterned after those used in ordinary drainage work. The superstructure consisted of two longitudinal Howe trusses supported crosswise by bracing rods and resting on four corner wheels running on rails. Two of the shovels had 1-cu.yd. dippers and the third a 1½-cu.yd. dipper, placed at the end of a 40-ft. handle, which in turn was operated from an 80-ft. boom, inclined at 45 deg. and supported by an A-frame.

The boom was so pivoted at the front end of the shovel platform that it could revolve through an angle of 180 deg., and in this way the shovel had a reach nearly equal to that of a large modern machine; but to counteract the overturning effect of the great length of boom, the trucks had to be placed 35 ft. apart. The outer rail on which the trucks ran was placed about 3 ft. from the edge of the coal.

A Dragline Machine Was Built

With this apparatus, overburden was moved by contract for about 8 yr. until Butler Bros., of Danville, installed an entirely new type of excavator of the dragline variety. This machine is shown in Fig. 2. These dragline excavators operated in pairs from the top of the bank to be removed, running on a track parallel to the face. A broad truck running on rails supported the operating mechanism, and from this main platform a long boom extended, being supported by guy ropes.

Along this boom, 115 ft. in length, a dragline scoop was operated. These machines were kept in operation until about 1910, and one of the old excavators can still be seen near the Mission Field tipple, while the spoil banks deposited by them are plainly visible running north and south along the east side of the Mission Field.

The Mission Field stripping area contains several hundred acres south of the interurban track and just east of the Mission Field station. In this field many of the early stripping experiments were worked out. Although the term "Mission Field" properly includes an extensive area covered by the old Mission grant, of late years the term has often been used to signify the tract operated by Butler Bros. and later by the Mission Mining Co., in distinction from the more westerly part of the Mission tract now being operated by the Two Rivers Co. The stripping of the former area by the Mission Mining Co. was completed about the middle of October, 1915.

In 1911 a model 250 Marion shovel, the latest then in existence, was installed by the Mission Mining Co. in the northwestern part of the Mission Field. This shovel

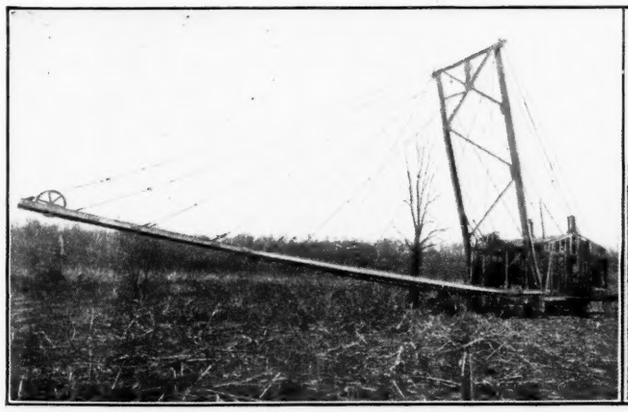


FIG. 2. BUTLER BROS.' DRAGLINE EXCAVATOR

FIG. 3. THE MISSION FIELD STRIPPING

was one of the first of the revolving type, and for its development and introduction much credit is due Grant Holmes, of Robert Holmes & Bros., manufacturers of mining machinery, of Danville, and to W. D. Hartshorne, president of the Mission Mining Co.

The Leveling Device Was Important

The success of this large shovel was due in great part to the introduction by Mr. Holmes of a hydraulic cylinder over each truck to keep the turntable level when the shovel was being moved. The two hydraulic cylinders at either end are connected by a pipe in which is a valve, so that they can be shut off as desired. When the shovel is moved, this connection is opened, and an upward movement of one truck, owing to an irregularity in the track, is compensated by a reverse movement of the other piston, thus maintaining the shovel platform level.

The Mission Field stripping, Fig. 3, was operated by the radiating, fan-shaped, through-cut system in which the shovel travels back and forth in straight lines instead of round and round a given area to be stripped. This latter method is known as the "island system." At Mission Field the overburden averaged 17 to 18 ft. in thickness and was removed without blasting.

The shovel crew and the daily expense were as follows when the shovel completed the area operated by the Mission Mining Co.: One engineer at $3.60; one craneman, $3.22; one fireman, $2.62; one oiler, $3; three helpers around the shovel at $2.62 each, $7.88; coal, six tons at $1.10, $6.60; oil, grease waste, etc., $\frac{3}{10}$c. to $\frac{4}{10}$c. per ton of coal secured; repairs per day, $25. The cost per cubic yard depends upon the daily yardage made by the shovel, which is variable, and should include interest and

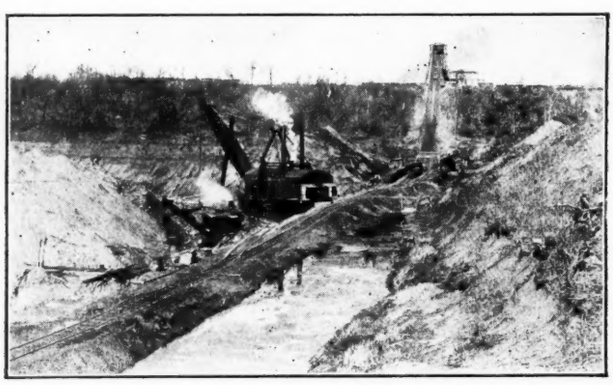


FIG. 4. THE TWO RIVERS STRIP PIT, SHOWING TWO STEAM SHOVELS, THE INCLINE AND TIPPLE

depreciation, calculated upon the cost of the shovel, which in this instance was $23,500.

The coal under the shale was about 5½ ft. thick, and to remove it 1¾-in. holes were placed 5½ ft. back from the coal face and 5 to 6 ft. apart. The powder charge was 1½ to 2 pints per hole. These holes were drilled with a Temple-Ingersoll percussion drill, operated by a portable electric-air pulsator. Before blasting, the top of the coal bed was swept clean so as to remove the last traces of the overburden. After being shaken with the powder, the coal was barred down and loaded by hand into 1½-ton cars, which in trips of nine were hauled up an incline by an engine in the tipple. The cars passed over a crossover dump, and the coal went over a shaking screen with 2-in. holes which removed the slack.

On account of the nearness of Salt Fork River the stripping was occasionally flooded, although a dike was built along the river bank. Also on account of the basin formation of the strippings, these formed a natural catch-basin for the water from the surrounding hills. This water was pumped out by an electric pump centrally located.

On account of the occasional flooding and an inability to operate much of the time during the winter, the cost of stripping must be distributed over the yearly period, and since certain overhead charges are continuous and the interest charges are fixed irrespective of the day's work, the charge per ton of coal is much higher than if the plant could be operated continuously.

Other mines at which the coal is being stripped solely to obtain the fuel and without utilizing the overlying shale are the Two Rivers and Carbon Hill properties.

At the Two Rivers stripping, which is about a mile southwest of the Mission Field, there is a stripping area of about 200 acres, of which 32 acres has been uncovered up to the present time. An 8-cu.yd. Marion shovel is being used to remove 20 to 30 ft. of overburden, of which shale constitutes 6 to 12 ft. A Temple-Ingersoll rock drill is used here as at the Mission Field. This drills 3-in. holes 6 to 7 ft. apart, and in each about 1½ qt. of black powder is used. A pushdown blasting machine fires the holes, and this amount of powder merely loosens the coal, but does not throw it about. Fig. 4 shows the large digging shovel, the small loading shovel and the incline up which the coal is hauled to the tipple. The small shovel, used to load the coal into the mine cars that are hauled up the incline to the tipple, has a record of nearly 1,200 tons loaded in 8 hr., but the daily average is only about 800 to 900 tons. The tipple contains shaking screens and picking belts on which the lump and nut sizes are picked by hand, the coal being then loaded into the railroad cars over adjustable loading booms. At Two Rivers, as at Mission Field, it is necessary to build levees to protect the strip pits from the overflow of Salt Fork River.

The Operation at Carbon Hill

The Carbon Hill stripping is located about 4½ miles east of the Mission Field and about 1 mile southwest of Danville. This pit has an advantage of the others in this district in not being subject to floods, as it is located away from any stream and is easily drained by tile. As at all the other strippings in the district, the coal seam is practically flat and is about 6 ft. 4 in. thick. About 40 ft. of overburden is now being removed by a recently installed No. 270 Marion revolving steam shovel equipped with a boom 90 ft. long and having a 5-yd. dipper. The shovel makes a cut about 30 ft. wide, while the length of the cut is about 1,200 ft. A small loading shovel, Model 31, similar to that used at Two Rivers, is also employed at this pit to load the coal into cars that run on a track parallel to the coal face and about 20 ft. from it.

An Ingersoll-Rand portable electrically driven compressor furnishes air for Jackhamer drills which put down 1¾-in. holes about 6 ft. deep, the coal at this mine averaging 6 ft. 4 in. in thickness. The holes are placed 6½ ft. apart and about an equal distance back from the coal face. Pit cars holding about 2½ tons are used. These are hauled in trips by steam locomotives to a tipple.

This tipple is equipped with a Wilson crossover dump, and the coal is delivered to a Jeffrey steel picking belt 70 ft. long and about 4½ ft. wide, to which it is delivered by feeders of the reciprocating type made by Holmes Bros. After the picking belt comes the shaking screen, the sequence of cleaning operations thus being the reverse of that employed at the Two Rivers tipple, where the picking follows the screening.

Electric power is employed at the tipple, this being obtained from the interurban power plant. A 20-hp. motor is used to drive the tipple machinery.

The present large shovel was installed about October, 1914, and for some years before this time the usual arrangement shown in Fig. 5 was employed. This consisted of an ordinary revolving boom shovel with a 2-cu.yd. bucket that dumps into a tilting pan, which delivers the material gradually to a traveling belt similar to a tailings stacker on a bucket dredge.

The objections to this outfit were the extra men required to operate the shaking pan, although this could probably be arranged to work automatically, and the difficulty of handling large lumps and boulders, also the danger of material falling from the stacker upon the men working in the pit below it. This apparatus disposed of the waste quite effectively, and a satisfactory similar arrangement may some time be developed.

One of the early revolving shovels in the Danville region was a small model used at the old Gray mine stripping about half a mile north of the Mission Field. This stripping was unique in that the coal was to be hauled through an old entry that connected the strip pit to the hoisting shaft used for the underground mine. The surface hoisting plant was burned before the strip pit had been developed to any extent, and stripping was consequently abandoned.

A Mine and Brick Factory

Undoubtedly one of the most interesting plants in the Danville district is that of the Western Brick Co., located about 4 miles west of Danville along the line of the Illinois Traction Co., and extending southward from that line a distance of half a mile or more to the South Fork of the Vermillion River. South of the river the same company operates a drift mine in the same seam of coal—the No. 7 of the Illinois Geological Survey.

This operation is worked both for shale and coal. An upper layer consists of soil containing a large amount of glacial débris, evidenced by the occurrence of granite and other boulders not common to the region, which have evidently been transported from the far North by the glacier. Below this glacial deposit is a stratum of bluish gray shale, 18 to 30 ft. thick; compact, but so thoroughly laminated that it is easily removed with a steam shovel without blasting. Beneath the shale is the No. 7 coal bed of about 6 ft. thickness. This coal was formerly mined underground by the room-and-pillar method, and the sagging of the shale above the rooms is quite apparent in places, and as the steam-shovel mining the shale must run on top of the coal, the old workings must be carefully watched to prevent the shovel from sinking into them.

The steps pursued in the removal of the several deposits are as follows: The superficial glacial deposit is hydraulicked by two nozzles 1¼ and 1½ in. in diameter connected to the same main delivery, which is a 4-in. hose. Each nozzle delivers about 1,000 gal. per min. under a pressure of 135 lb. per sq.in. at the pump. The water for hydraulicking is furnished by a pumping plant at the river nearby. This plant is equipped with a Smith-Vaile duplex pump with a capacity of 2,000 gal. per min. In the same building is a small pump for supplying the boilers which generate steam for this plant.

The surface is thus washed off, either into an adjoining valley or else into the excavations made by removing the shale and coal. The hydraulicking is not carried on during the winter months, when freezing would greatly interfere with or render the work impossible. Enough

FIG. 5. AN APRON CONVEYOR COAL-STRIPPING MACHINE

shale may, however, be uncovered during the open season to keep the plant in constant operation. The amount of soil hydraulicked during an 8-hr. shift varies from 100 cu.yd. in tight ground to 2,000 cu.yd. in loose ground. One man operates each nozzle, his wages being $2.45 per day of 9 hr.

A Steam Shovel Removes the Shale

The shale is removed by a 70-ton Bucyrus shovel which has a dipper of 1½-cu.yd. capacity. Three shovelfuls fill each of the dump cars, which stand in trains of six on a track alongside the shovel. This machine works in an approximate circle, going round and round a given piece, so that it does not have to be turned.

The shovel shift depends upon the operation of the brick plant, but the daily average output is 148 to 178 cars, each holding 4½ cu.yd. The shale is hauled to the foot of the incline and then to the brick plant.

Parallel to the coal face and back from it about 5 ft., holes are placed 3 in. in diameter and 5 to 6 ft. apart. Each hole is charged with 2 qt. of black powder, this amount just loosening the coal without throwing it about or producing undue breakage. A 25-lb. keg of powder produces about 100 tons of coal. The coal is shoveled by hand into a 2½-ton car and hoisted up an incline to the storage bin of the brick plant, from which it is distributed to the kilns and boiler plants. The stripped coal, supplemented by that produced by the drift and slope south of the river, amounts to 70,000 tons per annum.

In common with other coal measures in the Danville region, the No. 7 seam contains a considerable amount of pyrite, which is separated by hand and sold to another mining company in the neighborhood, which concentrates and cleans it before selling it to a chemical company for the manufacture of sulphuric acid. The money received from the sale of the pyrite is given to the miners as an inducement for them to remove this material.

The shale is hauled up a separate incline from the coal, and at the top is dumped over a bar screen into pug mills, where it is ground to the desired fineness, then mixed with water and pressed into shape by the brick machines. The material then runs out on bands, and after being cut into size is loaded onto steel cars and dried in ovens heated by hot air from the kilns. The bricks are finally burned for seven days, about 36 tons of coal per kiln being used. There are 59 kilns in the plant, each holding 65,000 to 70,000 bricks. The bricks are cooled for four days by a current of air forced through the kilns.

It is estimated that about 17 days elapse between the mining of the shale and the shipment of the finished brick. About 1,000 tons of coal is required per week for the kilns.

FIG. 6. STRIPPING SHALE FOR BRICK MAKING FROM ABOVE COAL USED FOR BRICK BURNING

The writer is indebted to W. G. Hartshorne, president of the Mission Field Mining Co., Grant Holmes, of Holmes Bros., and F. W. Butterworth, general manager of the Western Brick Co., for reviewing the data contained in this paper, and to the Illinois Coal Mining Investigation for several of the illustrations taken from Bulletin 2 of this organization.

Extracts from a Superintendent's Diary

When a man allows himself to be persuaded into buying something against his better judgment, he immediately begins to reason with himself in an endeavor to convince himself that he really acted wisely. If he lives long enough and the article that he purchased does not wear out in the interim, he is more than apt to succeed—unless the article in question was purchased on the installment plan; and in that event he will probably not succeed. Several of our employees purchased automobiles last year, and by the law of averages should now have reached that state of bliss. Unfortunately, the sudden rise in the price of gasoline has upset all of their arguments just at the time when they should have been through with argument, and as a result they have been placed in a most trying predicament.

Our commissary manager was the first one of our citizens to fall a victim to the craze, and after a year of earnest endeavor had about convinced his thrifty wife that his car was a good investment by pointing out that it enabled him to get the amount of fresh air that the company physician insisted was necessary if he expected to retain his health, and at the same time made it possible for him to give his family the first real pleasure they had known since they had become exiled in a mining village. Now that the pinch on their purse has made it necessary to abandon most of the automobile trips about the country, every member of the family, the thrifty wife included, has become dissatisfied with their lot (most of their years have not been spent in mining camps), and the poor man has not a minute's peace. He spends much of his time after commissary hours wandering about the country highways on foot, ostensibly for the exercise it gives him, but if one is to believe his neighbors, these jaunts may be undertaken as an excuse for getting out of reach of his wife's tongue.

Soon after our commissary manager learned to operate his machine successfully our camp physician began to receive automobile catalogs, and within a few weeks an automobile salesman appeared on the scene and carried off the doctor's contract when he left.

The doctor assured us next day that for a long time he had realized that he had not been giving proper service to the people living several miles out, but he had done the best that was possible with the means at his command. Now, however, all would be changed, and he would be able to give his country patients the same attention that the residents of the camp received. That explanation satisfied everyone contributing to the doctor's list, and he was voted a clever fellow. His wife, however, having no especial interest in the number of calls that her husband could, would or should make, required a different explanation, nor was she disappointed. Like the commissary manager's wife, she had never become entirely reconciled to life in a mining camp, and the advent of the automobile would mean to her, according to the husband, trips into the city whenever her fancy suggested them.

The doctor reasoned well, and everything worked out just as he predicted, but the advance in the price of gasoline has upset all of his calculations. Now he is in a peck of trouble. His gasoline bill threatens to outrun his monthly collections, his wife has "caught on" in city society and his country patients are not happy unless he passes and greets them every morning.

And the affairs of our master mechanic and chief clerk are also badly tangled for similar reasons.

The Breathing of Carbon Monoxide affects that portion of the blood that carries the oxygen, called the hemoglobin. The entire body is fed with oxygen, which is carried by the hemoglobin in the blood. The blood receives this oxygen from the air in the lungs. When a person breathes an atmosphere containing carbon monoxide, the latter destroys the hemoglobin, and instead of the blood furnishing the body with oxygen, it supplies the poisonous carbon monoxide. Another result is that the carbon dioxide, which is a waste product of the human system and is normally carried by the blood to the lungs and there thrown off, is not eliminated as readily in case of carbon-monoxide poisoning.

Cost of Upkeep of Electric Safety Cap Lamps

SYNOPSIS—Figures showing the entire cost of upkeep of an electric cap-lamp service for a year, with an estimate on the cost of maintenance for a station with 250 lamps.

In *Coal Age* on Oct. 2, 1915, an article appeared dealing with the cost of upkeep of electric safety cap lamps of a type approved by the Bureau of Mines. But the time of observation covered only six months, and only the manifest interest in advance information as to the cost of operation justified reporting the result at so early a stage. It was shown that the cost for maintenance and repair, excluding cost of current and all damage caused by miners, was not quite 1c. per delivered lamp-shift.

It is possible now to give the results after a test extending over 12 months of close observation. This test was made at the Vulcan mine, Newcastle, Colo., of the Rocky Mountain Fuel Co., of Denver, in the same state. It is important to note that the installation was not large, and so the figures well represent what might be readily duplicated in a similar small station. Moreover it may be noted that the lamps were tended by the regular lampman of the mining company and not by the experienced and specially trained men of the concern by which the lamps were installed.

A Year's Test Under Unfavorable Conditions

Nor are these the only reasons for thinking that the results are possible of duplication at any other plant. The Vulcan mine dips at an angle of over 45 deg., and the lamps are consequently operated under the most unfavorable conditions, being subjected to the roughest usage. On Dec. 23, 1914, 27 lamps were put into service, and monthly statements were made out, showing not only the number of delivered lamp shifts and burning hours of the different lamps, but every repair necessary and every spare part consumed. These reports are open for inspection and verification.

The total number of delivered lamp shifts during the 12 months was 6,350, making a total of burning hours of 61,700. The number of lamp months was 324, and the cost of upkeep excluding labor was, as shown, $65.52 net, or $0.2022 per lamp per month. This figure, which is a trifle more than 20c., included all material needed to keep the lamps in good working condition. Even lye solution, vaseline and acid received due consideration.

Upkeep of Lamp Costs Only a Cent Per Day

The average number of lamp shifts was 19.6 per month. Thus the upkeep per shift per lamp was only $0.0103. Including the 27 bulbs furnished with the lamps, 113 bulbs were rendered valueless during the year. Of these 31 were destroyed by the miners. These may be figured as being half-consumed before they were destroyed, and the same assumption is made about the 27 bulbs in use at the end of the period.

Thus 61 bulbs may be figured as half-consumed, which is equivalent to about 31 bulbs wholly burned out. Thus it is fair to declare that the requirements of the year's running were 82 bulbs. These delivered, as stated, 61,700 burning hours, or 753 hr. per bulb, which is a remarkable result.

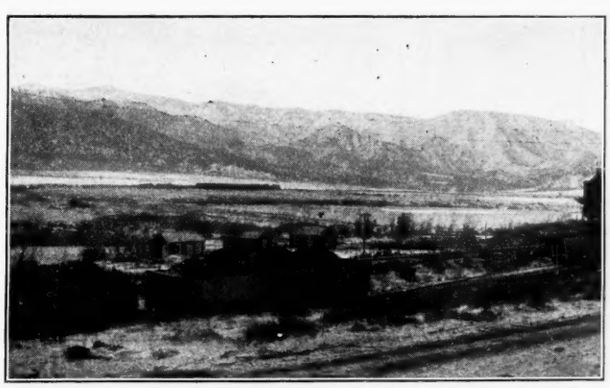
COST OF MATERIAL AT SELLING PRICES USED AT VULCAN MINE DURING 12 MONTHS

Material Consumed and Destroyed by Carelessness:		
86 bulbs, 45c. each	$38.70	
49 cable lengths, 4 ft. each, 20c. each	9.80	
20 spring terminal sockets, 12c. each	2.40	
8 connection pieces, 20c. each	1.60	
2 lens holders, 20c. each	.40	
100 lead seals for lamps, 60c. per 100	.60	
15 rubber corks, 5c. each	.75	
10 lead check nuts with washer, 13c. each	1.30	
17 lamp holders, 15c. each	2.55	
3 lenses, 20c. each	.60	
3 lamp bodies, 70c. each	2.10	
8 celluloid battery casings, $1.40 each	11.20	
43 celluloid battery tops, 30c. each	12.90	
9 oz. celluloid strips, 25c. per oz.	2.25	
5½ pt. celluloid paste, $1.75 per pt.	9.62	
Gross total of material	$96.77	
Less 20 per cent. trade discount	19.35	
Net total of material		$77.42
Material for Care of Batteries:		
10 cans of lye solution, 10c. each	$1.00	
8 lb. of vaseline, 8c. lb.	.64	
19 gal. of acid, 18c. gal.	3.42	
		5.06
Net total		$82.48
Material Destroyed by Carelessness of Miners:		
34 bulbs, 45c. each	$15.75	
17 lamp holders, 15c. each	2.55	
3 lenses, 20c. each	.60	
3 lamp bodies, 70c. each	2.10	
1 lens holder, 20c. each	.20	
Gross total of material	$21.20	
Less 20 per cent. trade discount	4.24	
		16.96
Material consumed by use during 12 months		$65.52

It is interesting to note that no battery plates had to be renewed during the whole year, and the mine reports that all the electrodes are still in first-class condition.

It will be noted that 82 bulbs were sufficient for 27 lamps, so that less than three bulbs served for each lamp for one whole year.

Forty-nine cable lengths had to be renewed during the trial year. Let it be assumed that the 27 cables were



VIEW FROM RESCUE HOUSE AT VULCAN MINE, NEWCASTLE, COLO.

half worn out when the year was concluded. This will make the equivalent number of cables a trifle under 63. In other words, as the total number of delivered lamp shifts was 6,350, a cable lasted for over 100 shifts, or as 19.6 shifts were delivered per month, it lasted for over five months, a long life for a part under such stress.

But even this excellent result should be bettered, for a new fastening has been introduced which appears likely to prove, from actual tests now being made, 100 per cent. more durable than the old. This fastening was not used with the lamps at the Vulcan mine.

But of course this estimate does not cover the labor of maintenance, though an installation as small as the one under consideration does not give the most satisfactory results from this important point of view. It is obviously unfair to attempt to figure the labor cost of an installation from the experience of a small mine with only 27 lamps in service, though it is a fair basis for figuring the life of the lamps and the cost of their upkeep.

LABOR ON LAMPS SHOULD COST 2½C. PER SHIFT

It has been found that 250 lamps can easily be tended by one lampmaster at $75 per month and one assistant at $45, or for $120 per month. Granting that each lamp is operated for 19.6 shifts, the 250 lamps deliver 4,900 shifts for a cost of labor of $120, or $0.0245 per lamp shift. Adding the cost of upkeep to this, the charge for both upkeep and labor of maintenance per lamp shift would prove for the first year $0.0348, or roughly 3½c., which is a low figure and shows that even where its safety features are not considered in its favor the electric safety cap lamp by its cheapness of operation commends itself for adoption.

The lamp used at the Vulcan mine, regarding which these figures have been compiled, is manufactured and sold by the Mannesmann Light Co. of America, with offices at 331 Fourth Ave., New York City. The lamp is of American manufacture and is sold outright or leased and maintained by the manufacturer.

Large Companies and Safety

Chief James E. Roderick of the Department of Mines of Pennsylvania in the advance copy of the preliminary remarks of his annual report for 1914 makes the point that the large operating companies are better able to safeguard their employees than the smaller operators.

"In providing against accidents," he writes, "the large operating companies have a great advantage over the small ones. Many of them have specialized in safety methods and give every consideration to the welfare of the workmen. The installation of new devices and the changes in the methods of mining today are generally preceded by the statement and interrogation, 'It pays, but is it safe?' or, 'It is a clever solution of the problem, but is it injurious to the employee?'

"The average number of accidents, however, remains about the same for both classes of companies. This seemingly contradictory condition is due to the fact that occasionally a great disaster, a life-wrecking explosion of gas and dust, that cannot be effectively guarded against will come to one of the big mines, and the record is spoiled. Where the specialized efforts of the large companies prove effective is in lessening the number of accidents from falls, cars and other causes that exact a continuous toll of life in all mines."

It is interesting to note, in connection with this, that the production per life lost in the anthracite region in 1914 was 151,982 tons and has never been equaled since the first anthracite law was enacted in 1870. Last year's accident record for the year in the anthracite region was the best since 1902 and in the bituminous region no such low fatality return has been secured since 1897.

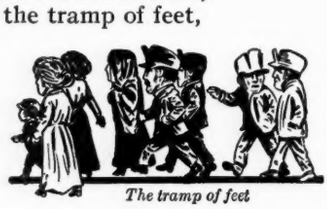
The Miner's Wife

Written Expressly for Coal Age

BY RUFUS T. STROHM

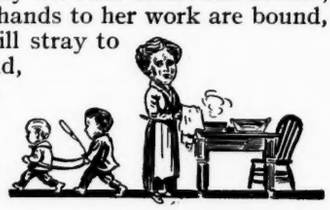
THE miner's job is the very kind
That casts its spell on the public mind,
Which, though it tries, cannot understand
His calm, cool air and his steady hand.
His working place, with its wall of gloom,
Appears so much like a yawning tomb
That few would wish for a miner's life—
But no one thinks of the miner's wife.

About her tasks, through the livelong day,
Serene she goes, in her wifely way;
But all the while, as her fingers fly,
Her ear is keen and alert her eye.
A sudden crowd in the little street,
A distant cry or the tramp of feet,
And a pang of fear, like a stabbing knife,
Darts through the heart of the miner's wife.



The tramp of feet

THE miner views with a sort of scorn
The thousand risks that the pit has born;
Not so his wife, as from room to room
She wends her way with her brush and broom;
For though her hands to her work are bound,
Her thoughts will stray to the underground,
Where dangers lurk and where perils rife
Disturb the peace of the miner's wife.



Her thoughts will stray to the underground—

She may not know, and she cannot tell,
But that he's kissed her a last farewell,
Since death may come with a sudden claim
For one false move in the mining game;
So though she seems to be brave and bright,
To banish gloom by a spirit light,
Yet through the day, with its calm or strife,
The ghost of fear haunts the miner's wife.

The Labor Situation

SYNOPSIS—In the New York conference the operators concede a 5-per cent increase on day and dead work and grant the mine-run scale in western Pennsylvania and parts of Indiana, the only parts not now under such a scale. The miners also are allowed 3c. per ton additional on all coal mined; a supplemental allowance of 2.39c. for machine work in western Pennsylvania and 0.5c. for chain-machine work in Indiana being added thereto. Miners meet in district conference at Du Bois, Penn.

After a prolonged conference the subcommittee of soft coal operators and miners in western Pennsylvania, Ohio, Indiana and Illinois arrived at a tentative agreement regarding the new wage scale and submitted this to the general scale committee, which voted its approval of the contract on Wednesday, Mar. 8. Of course, the decision reached will have to be ratified before it is of binding force. The operators have made concessions with regard to the payment for mining, dead work, yardage, room turning and day labor. At the behest of the miners they have changed the machine differential in western Pennsylvania and Indiana in a manner which militates against the use of machinery.

Where the payment has been based on the weight of screened product, as in western Pennsylvania and Ohio, the operators have given up that advantage. The statement in the synopsis last week, which states that the miners had abandoned their demand for mine-run payment, was based on a rumor which was not justified by the actual facts. The miners stood firm for their demand and the operators conceded it.

Day Workers Receive Less Than Miners

The miners have made several modifications of their original demand. They asked for 20 per cent. for the day workers, and they got 5 per cent. The day workers do not fare quite as well as the miners, for the increase in the machine rate in western Pennsylvania is 5.39c. on 44.61c., or 12.0824 per cent. Chain machine work in Indiana rises 3½c. on 48½c., or 7.2165 per cent. In Ohio the increase is 3c. on 47c., or 6.3829 per cent.; in southern Illinois the machine miners gain 3c. on 50c., or an even 6 per cent.; in Danville, Ill., and with the punching machines in Indiana, it is 3c. on 51c., or 5.8823 per cent., and in central Illinois it is 3c. on 54c., or 5.5555 per cent.

But it must be remembered that the dead-work allowances of the miners only rise 5 per cent., the same as the day-work rates. So these percentages will be lowered in practice from those presented. But from another point of view these allowances, though not as large as anticipated, must not be overlooked, because a nonunion mine which does not pay them will be distinctly at an advantage if it only adds 3c. or 5.39c. to its wage scale.

The tentative agreement was reached late on Monday, Mar. 6, and with the exception of the rate for chain-machine mining in Indiana, which was advanced to 52c. instead of 51½c., is the same as published in last week's "Coal Age" (p. 418). It should be said, however, that the last clause should read "western Pennsylvania, thin vein, present rate 64.64c., new rate 67.64c."

Must the Miners Organize the Operators?

Owing to the scheduled meeting of the subcommittees of the anthracite operators and miners for Thursday afternoon, Mar. 2, the soft coal conferees held a short session that day. At its conclusion it was said nothing had been accomplished. President White said that if the operators could agree among themselves he could bring the miners together.

The mine workers' leaders had some pleasantries to deliver on the necessity in which they stood of organizing the operators. Apparently the Indiana and Illinois mine owners could not agree among themselves, the former having an advantage of 1½c. over the southern Illinois district, 2½c. over the Danville district and 5½c. over the central Illinois district, all in chain-machine mining. The Illinois men desire to wipe this out.

On Friday morning the miners made another proposition—5.39c. per ton increase in western Pennsylvania, 3c. per ton increase in all other districts for machine and pick mining, 10 per cent. increase for day work and 5 per cent. increase for dead work and yardage. This proposition is the same as that made on the previous Wednesday, but the scales for dead work and day's labor were new.

The operators immediately objected to these demands for day work and dead work, though they were smaller than the original demands of the union. Operators in the lobbies who heard of the offer declared that it would mean an increase of practically 8c. per ton. The offer was rejected, and the operators then submitted a counter-proposition of 2c. a ton increase in Illinois, Indiana and Ohio instead of 3c., but the miners voted it down.

A Good Teamster Knows What Is a Full Load

The mine owners who had come to the city while the conferences were in progress said they opposed the granting of any increase to the miners, claiming that if the demands were granted they would be driven out of business. The miners alleged that the operators always make such claims. Of course they do, and rightly so, unless nonunion regions give them assurances that they will be protected.

The miners load all the burdens on the operators they can induce them to bear, and then like stupid teamsters, they begin to use unseemly language trying to blame the operators for their inability to stagger under the load. "Why don't you break the Sherman law and raise prices to a profitable level?" they urge; "why don't you put your mines in order?" As a matter of fact the miners do not determine what is a fair load. They just keep loading onto the beast which they control till he drops onto his knees.

They have provided such a complicated system of dead work and day scale and pulled right and left on the operators that the nonunion horse without bridle cannot tell how to help pull the load, even should he show by chance any real sense of his responsibility to others in the industry. Let the wiseacres of the miners' union tell us how to figure just what increase should be made in the Pocahontas region to balance the recent changes. There are no known mathematics to make clear what is a fair equivalent of the increases in the scale. Nor is there the power to enforce the solution on the nonunion operator, even if the problem is worked out beyond cavil by the mathematicians.

Certain it is that they will take advantage of this in southern West Virginia. They will come up with the lowest rather than with the highest differentials. If it were as simple as the alphabet—3c. a ton, 2c. an hour, or a bonus of so much, which of course would have to be larger than the present increase—there would be a compelling slogan which might wake the echoes in the Tug Valley. The operators down there are decent chaps and would doubtless do their level best to prove it. But the matter is not put up to them in plain terms as it should be.

Miners Make a Further Concession in Wages

On Saturday, Mar. 4, the miners had a conference in the morning before the joint subcommittee met, and they presented a new offer:

"That pick mine-run coal be advanced 3c. per ton in the thin-vein district of western Pennsylvania, and on the basing prices in Ohio, Indiana and Illinois; that the price for chain-machine mining mine-run coal be 50c. in the thin-vein districts of western Pennsylvania and Ohio, 53c. in Indiana and 54c. in the Danville district of Illinois; that all dead work, yardage and room turning be advanced 5 per cent.; that all day labor be advanced 5 per cent., with the conditions of the Columbus day wage prevailing."

This new proposition resulted in a heated argument led by the Indiana representatives, who objected to the fact that under the new provision 4½c. was added to their old scale of 48½c., while only 3c. was added to the Illinois scale. However, the miners did not withdraw their demand, and the conference adjourned until Monday morning.

Early on Monday morning, Mar. 6, the joint subcommittee arrived at an understanding with regard to the Indiana scale and agreed to make it 52c. instead of 53c., an advance of 3½c. over the old scale of 48½c.

But after the rates were settled some other matters had to be discussed, and they occupied the whole of Mar. 7, with the exception of a brief recess for lunch and dinner. In the evening another meeting was called, and only at 11 p.m. was the scale completed so that the general scale committee could pass on it.

It was provided that all local inequalities and internal differences should be referred to the various districts for

settlement, but that no district convention shall pass resolutions which will increase the cost of production .or increase the price of labor. It is added that no districts shall change or modify any previous agreement or negotiations made in the district without a unanimous vote of operators and mine workers in the district.

The operators refused to make the eight-hour day to apply to the time between entering and leaving the mine; that is, "from bank to bank" as the expression runs. They agreed to the two-year contract, but they refused the weekly pay and the demand that every other Saturday shall be an idle day. But the matter which was most strenuously discussed was the clause providing that when any difficulty arises the matter must be submitted to the district board of arbitration and that the men must continue at work till the difficulty is adjudicated on pain of the payment of $1 for every day they remain idle. The miners wanted to eliminate the fine, but the operators were as firm in demanding it. The Illinois powder question was considered and was finally referred to the local boards for settlement.

The miners had been hoping for a larger increase, but it represents really all the change in prices since 1912, when the last adjustment was made. If the miner will look at the Monthly Review of the United States Bureau of Labor Statistics for March, 1916 (Vol. II, No. 3), he will see on page 32 that the yearly average relative retail price of food in 1912 was 96; in 1913, 98; in 1914, 101; and in 1915, 100. He however, will probably look further and point out possibly that his rise in 1912 was based on conditions in 1911, when the index number was only 90 and will say that despite the fact that in 1915 prices were 1 per cent. lower than in 1914, there has been a marked rise toward the end of the year, which may be expected to continue, being based on increases of wage elsewhere and the existence of war conditions which will be likely to hold prices at a high level.

As has been said, it is likely that the miner will take the increase since 1911 instead of that since 1912 and argue that living costs have gone up 11 per cent., but it must be remembered that, for those living in company houses, rent, which forms a large part of the monthly budget, has rarely been increased.

If anything, perhaps the tendency has been toward lowering rents. The anthracite miners, however, are in another class. To a large extent they live in houses privately owned and subject to the fluctuations of the real-estate market. They claim it is not fair to make deductions solely from the company-controlled house market, as many of them have to go or prefer to go to the cities and boroughs to live.

Central Pennsylvania Mine Workers Confer

On Feb. 29 the delegates of the United Mine Workers of America gathered in Du Bois for their biennial convention. There were 193 persons present, having 747 votes. The meeting was addressed by Hugh Daly, the vice-mayor, in place of Adam Haag, then at the Mercy Hospital in Pittsburgh.

The president, James Purcell, opened the discussion by stating that eight organizers—four American and four foreign—had been sent to the Buffalo, Rochester & Pittsburgh mines in the Indiana field. Two of the foreign organizers had been elected as delegates to the convention, and James Purcell urged that their place was in the field and not in the council chamber, as the situation in that section was critical. The discussion was quite warm, and finally an amendment requiring the organizers to return to work, and permitting the unions they represented to elect other men to replace them, was passed by a vote of 91 to 74. Addresses were then limited by resolution to 5 minutes, instead of 10 minutes, as was formerly the custom.

In his presidential address Purcell said that there had been much unrest in the Somerset and Greensburg fields and that requests had come that organizers be sent there. He detailed the efforts made to organize Colver, in Indiana County, and the assaults made on the organizing officials of the union at and near that place. He said that the local union throughout the district owed $12,537.84 to the organization and urged that some measures be taken to obtain a repayment of this money.

He said that several local unions had requested a change toward centralization and that he had some changes in view himself, but as the referendum vote had just turned down this tendency by a vote of 19,731 to 7,566, he did not think it well to discuss it. He recommended that scholarship prizes in State College be offered to members of the union or their sons and that the district organization pay the expenses of a specified number who qualify.

The president said it "was by a mere accident" that the new compensation law applied to coal miners. It was discovered that to include the miners it was necessary to pass a law repealing those provisions of the general mining act relating to mine foremen.

Richard Gilbert, the secretary-treasurer, said in his report that the membership of the district organization was only 663 in 1889. It was 38,649 in 1910. From 1911 to 1913 it dropped to 32,736, but in 1915 it increased to 38,066. In the past year 15 new local unions were organized and 6 old ones abandoned. In 1914 there were 146 local unions, while the report for this year shows 155.

There are 307 men employed as checkweighmen on the tipples of the district, and they received last year $204,910.93. Of the 307 mines receiving the services of checkweighman, 181 turned in enough money to the organization to be self-supporting so far as the checkweighman fund was concerned, but 126 mines are dependent on the organization of the district for support.

In October, 1911, a death fund was established in connection with the district organization, providing for the payment of $100 at the death of a member of the union and of $50 at the death of the wife of a member. The first year $3,450 was paid from this fund. The amount has increased each year, until in 1915 it rose to $26,456. In the four years and two months since the fund started, $84,950 has been distributed. Last year 309 members and 111 wives of members died. Of the deaths among members 72 were from mine accidents, 35 of these arising from falls of rock, 14 were from tuberculosis, 13 from pneumonia, 12 from heart disease, 12 from asthma, 3 from old age and 1 from drinking wood alcohol by mistake.

Of the deaths among women, 14 were from childbirth, 12 from tuberculosis, 10 from heart trouble, 10 from pneumonia, 7 from paralysis, 3 from operations and the remainder from various causes.

District Organization Is Worth $200,545.45

The report goes on to say:

The receipts for the year were $399,680.61 and the expenditures $297,768.28, or a cash gain during the year of $101,912.33. This added to the cash in hand from the previous year gives us a cash balance on hand, Dec. 31, 1915, of $158,622.86. Add to this the loans on halls and the amount lent to the national organization and the real estate owned by the district organization aggregating $41,831.59, and you will find the total wealth of your district organization on Dec. 31, 1915, amounted to $200,545.45.

By careful analysis it will be discovered that the past year has exceeded in receipts any other year in the history of your organization with the exception of the year 1909 and that on only three occasions since 1906 have the expenditures been lower. The past year stands unprecedented in cash gains and values, and the cash property rating is the highest ever reported in the history of your organization . . . The cash value of your district organization as represented by your treasury on Dec. 31, 1915, was $52,592.04 in excess of any amount ever before recorded in your annals.

In conclusion the secretary-treasurer said that he had handled the finances when they were only $2,937.71 a year and when the expenditures were $3,174.55 per annum. In all $7,661,364.05 in receipts and expenditures has been handled by the secretary-treasurer of the district since he first took office.

The scale committee will be as follows: Territory No. 1, William Welch, Nanty Glo, alternate John Brouhy; Territory No. 2, Henry Crago, Philipsburg, alternate Harry Vinton; Territory No. 3, James Feeley, Dunlo, alternate George Bassett; South Fork; Territory No. 4, Pat Dolan, Hopewell, alternate Silas Houck, Robert Dale; Territory No. 6, W. S. Davidson, Marion Center, alternate Samuel Chilton, Sagamore; Territory No. 7, Hugh McGinty, Osceola, alternate Alex Mullen, Madera; Territory No. 8, Frank E. Waite, Du Bois, alternate Ed. Thomas, Rimersburg; Territory No. 9, John Jacobson, Arnot, alternate Austin Coleman.

Consolidating a Poor with a Rich District

The question of consolidating districts Nos. 2 and 5 was brought up on Mar. 1. Apparently district No. 2, which is in better financial condition, does not see what it will gain from amalgamation. J. F. Blodzen, chairman of the committee on resolutions, F. E. Waite, J. J. Gochanur and George Bassett all spoke against it. Finally President Purcell urged that the districts were already large enough for one man to handle and would inevitably be much extended by adding new locals in places now without them.

The union voted to take the organizing of the B., R. & P. mines in the Indiana field out of the hands of President Purcell and hand it over to a committee of three, who will make an effort to unionize the field within the next three months.

The general scale committee of the bituminous operators and miners in western Pennsylvania, Ohio, Indiana and Illinois having come to an accord, the anthracite operators met the United Mine Workers at 2 p.m. on Mar. 9 at the Union League Club, New York City, to arrange a new scale. President White has stated that the rates of increase in the bituminous settlement should not be regarded as defining the needs in the anthracite controversy, where the wages are lower and the industry is more prosperous.

Conference on Standardization of Mining Reports

By J. T. Beard

SYNOPSIS—Proceedings of a conference of state mine inspectors, chairmen and members of state industrial commissions and safety organizations, called at the instance of the director of the Federal Bureau of Mines, Washington, D. C. Informal discussion on the general standardization of mining statistical reports and mining practice in the several states.

One of the interesting sessions in connection with the Safety-First Exhibit, held last week in the National Museum at Washington, D. C., was a conference of the mine inspectors of the United States and others interested in the standardization of mining reports and mine statistics. A large number of mine inspectors were present from many different states, including Alaska, California, Idaho, Montana, South Dakota, Colorado, Utah, Arizona, New Mexico, Oklahoma, Iowa, Missouri, Illinois and Pennsylvania. Besides mine inspectors there were present mine-safety and labor commissioners, chairmen of mine-rescue commissions and state industrial accident boards and statisticians and directors of accident insurance associations from many other states.

Although the conference was called by the Federal Bureau of Mines and was presided over by Van H. Manning, director of the bureau, its deliberations were unrestricted, the purpose being to secure a hearty coöperation of all departments interested and affected by the standardization of mining reports and statistics. The discussion was general and informal, and a motion was made and carried to terminate each discussion with the adoption of a resolution embodying a recommendation to a committee, to be appointed by the chairman, for presentation to the conference at a later session for its final adoption. It was understood that while such resolutions could not be considered as binding on any department or state, they would tend to unify and classify mining practice in the different states.

Discussion of Statistical and Calendar Year

The first subject discussed had reference to the adoption of a calendar year for all mining reports. The fiscal year, which varied in different states, was shown to be largely dependent on the meeting of the different state legislatures. It was argued, however, that the fiscal year required in different states had no necessary connection with the adoption of a calendar year for compiling such statistical reports as would be of the greatest value in tabulating and comparing results in different states. A motion was made and carried recommending the adoption of the calendar year ending Dec. 31 for all mining reports and statistics.

In the discussion regarding uniformity in accident statistics, reference was made to the efforts that had been made to effect a standardization and classification of mine accidents by the appointment of committees for the purpose of formulating a standard classification that would meet the general approval of the different states and greatly assist the work of the Federal Bureau of Mines. It was evident that this work naturally divided itself into two main classes, relating to metal mines and coal mines. Each of these classes was subdivided according to its requirements.

It was announced that the Federal Bureau of Mines in its work thus far had adopted the general forms of the Pennsylvania Department of Mines for tabulating reports of coal-mine accidents and other data. While these several forms, which were distributed in printed pamphlet form among those attending the conference, were considered good, the motion was made and carried to suggest to the committee the possibility of reducing as far as practicable the form of accident reports, which went into great detail and which it was thought could be much consolidated for general adoption by the different states.

On further motion forms 8 to 13 of the pamphlet were recommended to the committee for favorable consideration. These included the fatal and nonfatal accidents respectively in coal and metal mines and quarries combined, the classification of employees by occupation, and the classification of fatalities by nationality and occupation for coal mines and metal mines respectively.

Quite a lengthy discussion marked the consideration of form 14, which attempted the classification of fatalities for coal and metal mines and quarries combined, with respect to the nationality and length of experience of employees. Instead of the detailed classification in this form in respect to nationality it was suggested that for all practical purposes a classification of English-speaking and non-English-speaking employees would be sufficient. The motion was finally made and carried to recommend to the committee that this classification be modified by reducing the number of nationalities to English, Irish, Scotch and American.

What Constitutes a Fatal Accident

The discussion of the question of what constitutes a fatal accident in mining brought out a number of differing opinions from those present, but it was finally agreed that a fatal accident is one that terminates in death, regardless of the lapse of time. This definition suggested the difficulty, however, that it would be necessary to report the accident as a nonfatal accident in all cases where the victim had not died previous to the time of the report going to press. It was suggested that if death occurred later, the report for the following year could be corrected by showing that the accident had proved fatal.

The conference could not be regarded otherwise than leading to good results. In calling the conference the Federal Bureau of Mines acted in line with the suggestion that was made at the St. Louis meeting of the Mine Inspectors' Institute of the United States of America, last June, to the effect that the institute should appoint a commitee to act in conjunction with the Federal Bureau of Mines in taking steps looking to the standardization, not only of mining reports, but of mining practice in the different states. *Coal Age* desires to congratulate the Federal Bureau on the success of this first conference in

respect to a much-needed classification and standardization of all mining work.

One of the results of the meeting was the appointment of a committee to prepare an official report of the proceedings, which will be published by the Bureau of Mines as a bulletin and will contain copies of all the standard forms proposed and discussed.

The following committee was appointed by the chair: The coal-mining industry is represented on this committee by James E. Roderick, chairman, chief, Department of Mines, Harrisburg, Penn.; James Dalrymple, state inspector of coal mines, Denver, Colo.; the metal-mining industry by George H. Bolin, state mine inspector, Phœnix, Ariz., and W. B. Orem, state metal-mine inspector, Helena, Mont. The other members of the committee are L. W. Hatch, chief statistician, New York Industrial Commission, Albany, N. Y.; John Bohlander, president, Illinois State Mining Board, Pekin, Ill., and Albert H. Fay, mining engineer, Bureau of Mines, secretary of the committee.

In the discussion relating to the standardization of mining laws and regulations in respect to safety in coal mines the point was made that the miners are migratory and in going from one state to another they encounter different sets of laws, rules and regulations with which they are not necessarily familiar. It was unanimously agreed that the Federal Bureau of Mines should draft a standard set of rules and regulations for coal mines, similar to that prepared by the bureau relating to metal mines and published as Bulletin 75.

Need of Universal Signal System

Another point freely discussed was the adoption of certain universal danger signals, so that a miner from one state would meet the same kind of signals in a mine in a different state, which being the same as those used in the mines where he formely worked, he would at once recognize their meaning. W. L. Chandler, of the National Safety Council, extended an invitation to the state mine inspectors, representatives of industrial commissions and the Bureau of Mines to assist in the establishment of universal danger signals in hazardous industries.

The following is a list of the delegates and others who attended the meeting:

Robert N. Bell, state mine inspector, Boise, Idaho; John Bohlander, president, State Mining Board, Pekin, Ill.; G. H. Bolin, state mine inspector, Phœnix, Ariz.; Edward Boyle, chief inspector of mines, McAlester, Okla.; W. L. Chandler, National Safety Council, Mishawaka, Ind.; F. S. Crum, Prudential Insurance Co., Newark, N. J.; James Dalrymple, state inspector of coal mines, Denver, Colo.; Thomas H. Devlin, chairman, Illinois Mine Rescue Commission, Assumption, Ill.; A. W. Donovan, chairman, Massachusetts State Board of Labor and Industry, Boston, Mass.; Otto Ellerman, state mine inspector, Lead, S. D.; Charles Enzian, mining engineer, Philadelphia & Reading Coal and Iron Co., Pottsville, Penn.; Albert H. Fay, mining engineer, Bureau of Mines, Washington, D. C.; Frank Hall, deputy chief, State Department of Mines, Harrisburg, Penn.; R. Dawson Hall, associate editor, "Coal Age," New York, N. Y.; L. W. Hatch, chief statistician, New York State Industrial Commission, Albany, N. Y.; L. M. Jones, mining engineer, Bureau of Mines, Pittsburgh, Penn.; W. W. Jones, chief mine inspector, Albany, N. Y.; P. J. McBride, Bureau of Chemistry, Topeka, Kan.; H. D. McCaskey, Geological Survey, Washington, D. C.; William Maloney, territorial mine inspector, Nome, Alaska; Van. H. Manning, director, Bureau of Mines, Washington, D. C.; Royal B. Meeker, chairman, Accident Statistics Committee, National Safety Council, Washington, D. C.; G. F. Mickelbacher, Workmen's Compensation Service Bureau, White Plains, N. Y.; Augustus Munson, mine inspector, Dover, N. J.; W. B. Orem, state metal-mine inspector, Helena, Mont.; J. W. Paul, secretary, Mine Inspectors' Institute, Pittsburgh, Penn.; J. E. Pettit, state coal-mine inspector, Salt Lake City, Utah; D. J. Price, Bureau of Chemistry, Washington, D. C.; R. T. Rhys, coal-mine inspector, District No. 2, Ottumwa, Iowa; George S. Rice, chief mining engineer, Bureau of Mines, Washington, D. C.; W. W. Risdon, state mine inspector, Albuquerque, N. M.; I. M. Rubinow, chief statistician, Ocean Accident and Guarantee Corporation, Ltd., New York, N. Y.; J. J. Rutledge, mining engineer, Bureau of Mines, McAlester, Okla.; W. D. Ryan, mine-safety commissioner, Bureau of Mines, Kansas City, Mo.; M. L. Shipman, commissioner of labor and printing, Raleigh, N. C.; George Otis Smith, director, United States Geological Survey, Washington, D. C.; Sumner S. Smith, United States mine inspector for Alaska, Juneau, Alaska; ex-Lieutenant Gov. A. E. Spriggs, chairman, State Industrial Accident Board, Helena, Mont.; E. Sweeney, coal-mine inspector, District No. 3, Des Moines, Iowa; W. H. Tolman, director, American Museum of Safety, New York, N. Y.; C. H. Verrill, Bureau of Labor Statistics, Washington, D. C.; Thomas P. Wangler, Travelers Insurance Co., Columbus, Ohio; H. M. Wilson, representing the Mining Sectional Executive Committee, National Safety Council, Pittsburgh, Penn.; H. M. Wolflin, Industrial Accident Board of California, San Francisco, Calif.; J. T. Beard, senior associate editor, "Coal Age," New York, N. Y.

Oxygen Treatment for Carbon Monoxide Poisoning

By August F. Knoefel*

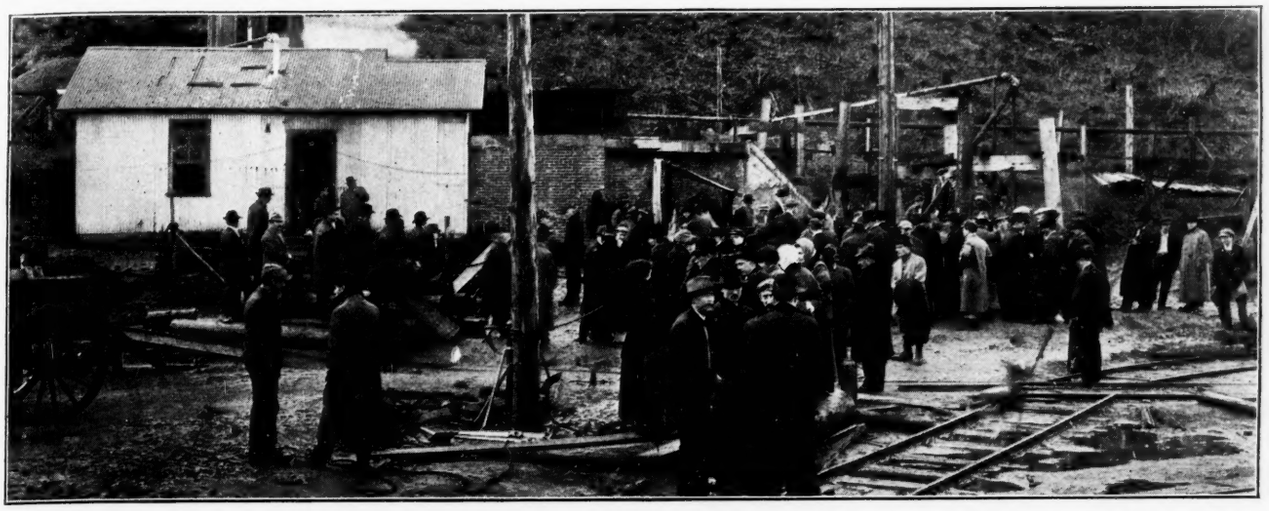
When administering oxygen under pressure, particular care should be taken to see that the pressure does not exceed 15 centimeters, water gage. If the victim of gas is not dead when discovered and the proper treatment is promptly begun, practically every subject should recover from the immediate effects of the gas in from 42 to 72 hours. There is always shock present, and treatment for this should be given without delay.

The principal elements in this treatment should be retaining the patient's own heat by covering the body and limbs with blankets, and this should be supplemented by the use of hot-water bottles, jugs of hot water or hot bricks. In applying this heat care must be taken not to burn the patient, by wrapping the objects in cloth or paper. A benumbed or unconscious person cannot notify you that the application is burning him. The person should be kept in a reclining position, with the head low.

The first-aider is supposed to confine his efforts to the following: 1. See that a doctor is notified. 2. Perform artificial respiration, with the administration of oxygen, if the same is at hand. 3. Treat the patient for shock. If he is conscious, a teaspoonful of aromatic spirits of ammonia in a half-glass of water should be administered. Other treatment should be left to the doctor, for the reason that any surgical operation if wrongfully or carelessly performed may forfeit the person's life. Artificial respiration should be continued even though the case seems hopeless. Many cases have been reported in which the person had been resuscitated after several hours of artificial respiration, in one of which the efforts were maintained for six hours, with the subsequent recovery of the person. After the person has been resuscitated he should be carefully watched, as relapses are not uncommon, when it will be necessary to again perform artificial respiration.

An observation of Dr. Haldane's might be of interest here. He states he found that when the blood contains 70 per cent. of carbon monoxide it requires from six to seven hours to free itself.

*Charge first-aid department, Indiana Bituminous Coal Operators' Association, Terre Haute, Ind.



TOP OF AUXILIARY SLOPE, NO. 1 MINE, RAVENSDALE, WASH., DURING RESCUE OPERATIONS

Disaster at Ravensdale, Wash.

SPECIAL CORRESPONDENCE

SYNOPSIS—The cause of the disaster at Ravensdale has not been discovered. The jury which investigated, however, declared that 6-ft. places should not be driven by solid shooting where the coal dust is dry and rises in the air, and the same investigators condemned the use of open lights by some classes of workmen. It also found that some of the men who were required to work with safety lamps had matches and even pipes in their possession.

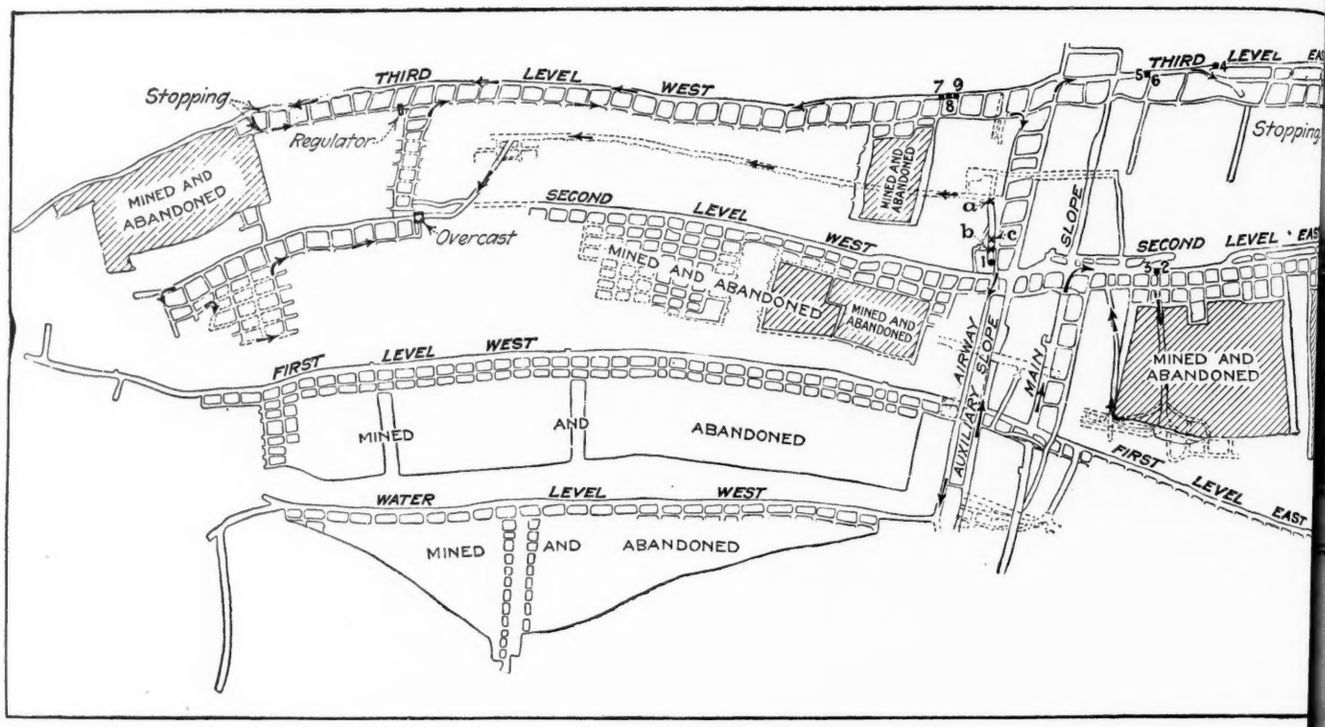
At 1:25 p.m. on Tuesday, Nov. 16, an explosion occurred at the Ravensdale mine in King County, Washington, killing 31 men. At the time of the explosion there were 34 persons in the mine, 28 of whom were on the third level and 6 on the second level. The mine is owned by the Northwestern Improvement Co., which is a subsidiary of the Northern Pacific Railway Co. The Ravensdale operations were opened about 20 years ago, but the present company took over the property many years later.

The coal at these workings is sub-bituminous in character, and the No. 5 bed in which the explosion occurred is one of the series of coal measures that extend from the Green River field on the southeast as far north as Ravensdale. No. 5 bed ranges from 20 to 25 ft. in thickness, and by the system of mining employed all or nearly all the coal in the bed was extracted. The coal dips at an angle of 47 deg. to the horizontal at the top of the main slope and flattens to 30 deg. near the bottom. The system of mining used in working this bed is clearly shown by the mine map that accompanies this description.

The mine was not considered gassy, and open lights were used along the gangways, but safety lamps were used entirely on the pitch. The mine in some places was rather dusty, and this dust no doubt was the cause of the extreme violence of the explosion, whatever may have been its immediate originating factor.

No. 5 bed was overlaid with bed No. 9 and underlaid with beds Nos. 3 and 4. The system of ventilation was such that the main and auxiliary slopes and that on No. 9 bed were intakes. The air traveled down the main slope to the second level and back through the rock tunnel to the underlying beds Nos. 3 and 4, and returned by a counter rock tunnel to a counter on No. 5 bed, and crossed the main slope by an overcast. In the second west the air split and traveled through a rock tunnel to No. 9 bed, then west along No. 9 and back through a rock tunnel to No. 5, thence along the main gangway to its face, then up the last chute and back through the working faces. The direction of air travel can be seen by referring to the map on pages 460 and 461, where the directions are plainly indicated by a number of small arrows.

MINE-RESCUE CREW ENTERING AUXILIARY SLOPE



After the explosion Robert Scott, mine superintendent of the Ravensdale mine, took charge of the rescue work. This party managed to get down the auxiliary slope as far as the first level, the main slope being completely wrecked. At that point the rescue men repaired the overcast, then worked down to the second level, where they found four men. Three of these were overcome by afterdamp, and on being taken to the surface two were resuscitated, but one was beyond recovery and died. One of the men, Mike Ferlich, a shot lighter, walked out unassisted.

At 4:15 p.m. that day James Bagley, chief inspector of mines for the State of Washington, arrived and took charge of the rescue work. With several other men he went down the auxiliary slope, and after clearing a hole large enough at the second level to crawl through, Bagley, Scott and four others worked their way down to the third level and to the overcast on the east side.

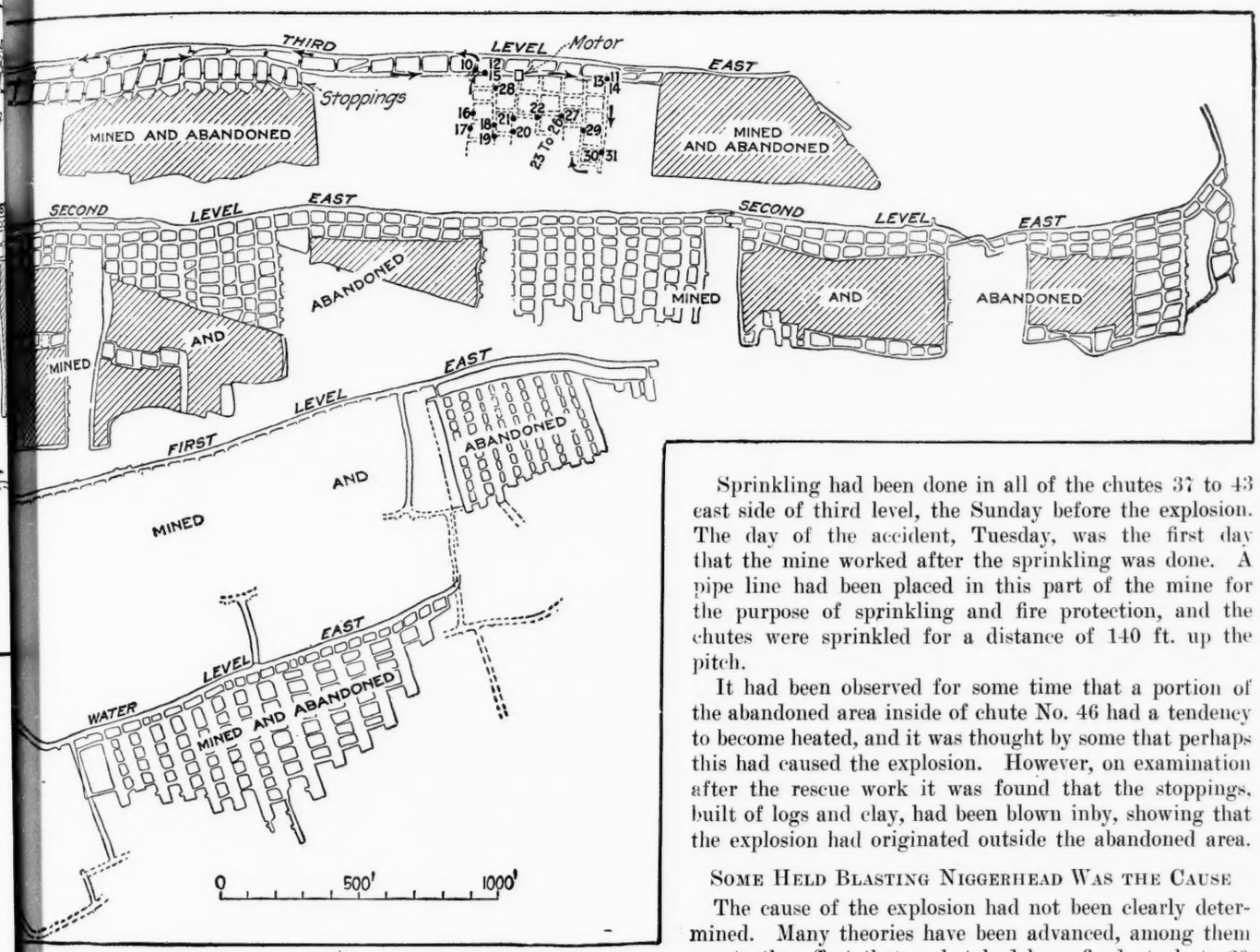
Here they found bodies Nos. 4, 5 and 6. Superintendent Scott then returned to the second level and examined the cave they had crawled under to get to the third level, and since the inspector and he were satisfied there were no men alive in that part of the mine they decided to eliminate the danger at the second level cavein. They worked at this point until the morning of the next day.

On the morning of Nov. 17 Inspector Bagley, with a rescue party, many members of which were equipped with Draeger helmets, succeeded in reaching the third level west, their object being to recover the three bodies known

LIST OF MEN KILLED, ALSO NAMES OF THOSE RESCUED

Name	Occupation	Working Place	Number on Map and Order of Rescue	Condition of Body When Found
T. J. Kane (M)	Mine foreman	.....	4	Burned, neck and legs broken
P. J. Dowd (S)	Shot lighter	.....	14	Not burned, cut and mashed about head
Edris Morgan (M)	Tracklayer	.....	8	Badly broken up
John Testa (S)	Chute starter	.....	28	Burned and badly broken up
Joe Krajne (S)	Loader	.....	15	Badly bruised and broken up, not burned
Dominic Novaria (S)	Timberman	.....	3	Badly broken up
Jack Muncie (M)	Haulage boss	.....	10	Not burned, badly broken up
Howard Salter (S)	Timber packer	.....	23	Burned
Jacob Remshak (M)	Timberman	.....	2	Badly broken up
Mansuti Pennachi (M)	Timberman helper	.....	13	Not burned, cut and bruised about face
Thomas Masiakoski (S)	Timber packer	.....	25	Face pink and burned, hair and eyebrows burned
Louis Minaglia (M)	Track cleaner	.....	11	Not burned
J. S. Davis (M)	Timberman	.....	7	Badly broken up, possibly burned
Mike Ferlich (M)*	Shot lighter	.....	a	
Noah Goodman (S)	Timber packer	.....	24	Burned, hair and eyebrows burned
C. B. Davis (M)	Pumpman	.....	5	Badly broken up, burned
J. B. Castagnia (M)	Timber packer	.....	9	Very badly broken up
Jack Errington (M)	Track cleaner	.....	1	Poisoned by carbon monoxide
Thomas Speck (S)	Motorman	.....	12	Not burned, poisoned by carbon monoxide
Romeo Medaine (M)	Miner	Room 37	16	Not burned nor badly broken up, quite natural
Joe Baldacci (M)	Miner	Room 37	17	Not burned nor badly broken up, poisoned by carbon monoxide
Jack C. Storey (S)	Miner	Room 38	18	Not burned nor bruised, poisoned by carbon monoxide
Louis Tazziolli (M)	Miner	Room 40	22	Not burned, in good condition
Angelo Morris (M)	Miner	Room 40	26	Not burned, showed carbon monoxide poisoning
Mike Demoshak (M)*	Timberman helper	.....	b	
L. Thebaut (M)	Miner	Room 42	31	Shirt burned off, carbon monoxide poisoning, hands not much burned
John Arko (M)	Miner	Room 41	27	Hair and hands badly burned
Frank Wegher (M)	Miner	Room 38	19	Hair not singed, poisoned by carbon monoxide, badly bruised
Martin Metznar (M)*	Timberman	.....	c	
Emil Pawallek (M)	Miner	Room 43	29	Badly burned
John Miller (M)	Miner	Room 42	30	Hair singed, shirt burned off, neck broken, poisoned by carbon monoxide
Joe Zgonc (M)	Miner	Room 39	21	Hair singed, neck burned
Joe Galob (S)	Miner	Room 39	20	Head and face broken up, not bruised, carbon monoxide poisoning indicated
L. Dasamantine (S)	Cager	.....	6	Burned and badly broken up

M—Married. S—Single. * Rescuer



NO. 1 MINE AT RAVENSDALE, WASH.

to be on that side, so that this part of the mine could then be sealed off and the entire air-current directed to the east side. The bodies of these men were found near the slope bottom, and the gangway was then sealed off temporarily.

The remainder of the bodies were known to be in the third east, and as the ventilation was disarranged and the workings filled with afterdamp it was necessary to clear the mine in advance of the rescue crews. This was done by means of Draeger teams who worked ahead of the others and investigated the condition of the stoppings and put in temporary canvases where necessary.

The outside crew advanced as rapidly as possible with the fresh air and replaced the temporary stoppings with erections of boards. On Nov. 18 at 11 p.m. ventilation was established as far as chute No. 37 on the east side and body No. 10 was found. Early next morning bodies Nos. 11, 12, 13, 14 and 15 were recovered.

The greater part of Thursday was spent in establishing ventilation in chutes 37 and 38. This was done by bratticing up the pitch and was found to be one of the most difficult parts of the rescue work. Early Friday morning, Nov. 19, bodies Nos. 16 and 17 were recovered, and on Friday night and early Saturday morning 12 bodies were reached, the last two bodies in chute 43 being recovered late on Sunday afternoon.

Sprinkling had been done in all of the chutes 37 to 43 east side of third level, the Sunday before the explosion. The day of the accident, Tuesday, was the first day that the mine worked after the sprinkling was done. A pipe line had been placed in this part of the mine for the purpose of sprinkling and fire protection, and the chutes were sprinkled for a distance of 140 ft. up the pitch.

It had been observed for some time that a portion of the abandoned area inside of chute No. 46 had a tendency to become heated, and it was thought by some that perhaps this had caused the explosion. However, on examination after the rescue work it was found that the stoppings, built of logs and clay, had been blown inby, showing that the explosion had originated outside the abandoned area.

Some Held Blasting Niggerhead Was the Cause

The cause of the explosion had not been clearly determined. Many theories have been advanced, among them one to the effect that a shot had been fired at chute 39 to break a niggerhead in the chute. In fact this was accepted by some investigators as the real cause, but at the coroner's inquest it was determined from witnesses that it was not customary to break niggerheads at this point in the chutes, but rather to break them at the wings before they went into the chutes. The chute was also examined from top to bottom and no signs of a niggerhead could be found. The chute was empty, and there was no evidence in the chutes to show any reason for breaking a niggerhead or large piece of coal.

It was decided by those who went into the matter in greater detail that the explosion originated at the top crosscut of chute No. 41. The three timber packers found in chute No. 40 near the top crosscut were burned, but this was not so with the miners in chute 40, who were found with the timber packers. The miners found in chutes 41, 42 and 43 all showed the effects of the flame. The two men in chute No. 43 were burned more severely than the others.

The miner in chute No. 41 was the only man who had not been back in his working place since shooting time. He may have had some gas in the place which he was clearing out. In some way this may have been ignited either by himself or by the timber packers in chute No. 40. The evidence at the inquest showed that one of the timber packers carried matches, and the miners in nearly all the chutes had matches on their persons when found.

At the foot of page 460 is a list of the men killed in the accident showing the condition in which they were found. Many of the men were badly broken up, while others were killed by the afterdamp resulting from the explosion. In this list also are details of the men rescued.

The mine was completely wrecked at the time of the accident and has been permanently abandoned. Every precaution it was thought had been taken to render the mine safe. The present manager, C. C. Andersen, had expended a large amount of money in making necessary improvements in the endeavor to make the mine as safe as possible. The company also owns mines in the Roslyn coal field of eastern Washington, and it is expected that these mines will supply the necessary fuel for the operation of that part of the Northern Pacific Ry.

FOUR RESCUERS IN THE RAVENSDALE MINE

From right to left—Simon Ash, deputy mine inspector; David C. Botting, Seattle, Wash., former state mine inspector; John Corey, United States Bureau of Mines, Seattle station; Peter Bagley, mine superintendent, Northwestern Improvement Co., Roslyn, Wash.

The verdict of the coroner's jury is as follows:

L. Theabout came to his death by reason of an explosion of firedamp and coal dust which occurred somewhere between chutes Nos. 37 and 43 on the east side of the main slope in No. 3 level. Thirty other miners also lost their lives.

After a thorough investigation of the Ravensdale mine by a tedious and careful examination, we have been unable to determine definitely the original cause or the exact location of the point of origin of the recent disaster. From the condition of the mine as observed by us and the testimony of the surviving miners who were affected by the concussion, the explosion must have been very violent. The regular current of fresh air supplied to those working in the mine was suddenly stopped by the falling of rock and coal and timbers in the passages through which the bodies of the entombed miners could be reached by immediate relief.

From the best information obtainable, a sufficiency of fresh air was circulated throughout the sections of the mine where the men were at work at the time immediately preceding the explosion, and no laxity on the part of those conducting the operation was shown by the testimony given before us, but aside from diligent inspection and capable management a rigid enforcement of safer and more skillful methods should be exacted of every person employed in this mine.

In a gaseous mine where the dust is dry and "blasting from the solid" is permitted, a chamber 6 ft. in width is entirely too narrow. It is hardly possible to drill a hole at such an angle as will assist a charge of powder in making an effective break in the solid body of coal. Extreme caution should be exercised by the "starters" who are obliged to use safety lamps when working near the bottom of the chutes, and we deem it unsafe for an open light to be used on the level by the men who load and move the cars to and from these chutes.

In the pockets of some of the dead miners who worked at the faces of the chutes where "safety lamps" were used were found matches and matchboxes and a smoking pipe, in direct violation of offenses defined in our state mining laws.

In conclusion we recommend that legislation to further safeguard the lives of men working in the coal mines of the State of Washington be enacted, to the end that the possibility of the occurrence of a similar disaster may be minimized and thus a more hopeful feeling of security against such deplorable accidents find lodgment among all our people.

JOHN SULLIVAN, foreman; JOHN MARBOW, THOMAS DOBSON, JAMES CARSON, E. F. LAWSON, DENNIS DRISCOLL.

Missouri's Washhouse Law

Following the example set in other states, the last Missouri legislature adopted a law that requires owners and operators of coal mines in the state wherein ten or more men are employed in digging coal to provide suitable washhouses, equipped with sufficient heating and washing facilities. Where both negroes and whites are employed, separate rooms are required. One section of the law exempts the owner or operator from liability for loss of or injury to all miners' effects left in any coal-company washhouse.

Employing Minors in Wyoming

Under a law which has just taken effect in Wyoming it is now unlawful in that state to employ any child under fourteen years of age "in any underground works or mine in or about the surface workings thereof or to [?] any smelter, coke oven, or to adjust any belt to any machinery; . . . nor shall they be employed in operating . . . any steam boiler, steam machinery or other steam generating apparatus." Violations of the law are punishable by a fine of not less than $25 nor more than $100, or by imprisonment for not less than 30 days or not more than 90 days, or by both such fine and imprisonment.

Explosion at Kempton, W. Va.

An explosion believed to be of dust occurred on Feb. 29 at Mine 42 of the Davis Coal and Coke Co., at Kempton, W. Va., in which 15 men were killed and 5 seriously injured. All the victims were foreigners. The explosion occurred soon after work commenced in the morning. Fortunately the cages in the shaft were not injured, and the men who were not in areas affected by its violence hurried to the foot of the shaft and were hoisted to the surface.

Deserve Success and You Shall Command It—Don't forget the special issue of "Coal Age" that will be published Apr. 1 and which will be devoted entirely to people and things that are successful. An article from you in this issue will not only add to the total of your income, but will benefit many of your friends in the industry. A lot of people don't know where you are or what you are doing—take this way of telling them. Introduce yourself to more than 12,000 coal mining men all over the world. Did you ever stop to realize what a forlorn business mining would be if it wasn't for the frequent interchange of ideas? The vast majority of information stored in your own head has come from the experiences of others. Have you done your part to advance the sum total of mining knowledge?

Editorials

Success

Success is the true touchstone of life. It is a subject in which everyone is interested; it is a condition of which we all desire to partake. For this reason the special issue of *Coal Age* to be published Apr. 1 and devoted entirely to successful men, successful methods and successful machines is sure to be a noteworthy and valuable number. On this page last week we called attention to this forthcoming special issue, and the inquiries received already indicate that *Coal Age* readers intend to coöperate to an even greater extent than last year in making this Success Number the livest and best issue of *Coal Age* ever issued.

If you have not selected your subject, do so at once, so that your article will reach us at the earliest possible date. Everything should be in our hands not later than Mar. 21. It requires time to edit so many articles and prepare the necessary illustrations. We want descriptions of all kinds of devices that are serving coal companies successfully. We want this issue to contain stories of men who have done creditable work and have been of real benefit to the industry. We are desirous also that this number shall cover many new methods of underground development, ventilation, drainage, haulage, etc. Tell us how failure anywhere has been turned into success. At many plants some simple idea or device has been largely instrumental in turning the tide of a coal company's fortunes.

Every article we publish will be paid for. All manuscripts will be numbered in the order of their receipt, and in case any are necessarily held over, owing to lack of space, those coming to us last will be thus set aside. There isn't a single man connected with the coal industry but can lay his finger on something or somebody right at hand that will fit into the most interesting kind of success story. Maybe it's the man you work for, or perhaps it's the machine that works for you. You yourself are aiming at a successful career. A worth-while contribution to our Apr. 1 issue will be one step up in the ladder leading to your own goal.

Publicity in Mine Affairs

Nothing hinders the coal operators from arriving at a conclusion in the wage controversy so much as the lack of certainty. If every operator paid his men by the ton and if the ton always contained 2,000 lb., then it would be possible to tell just what changes every employer of mine labor made in his wage rates. But now we have tons of all sizes and cars of all capacities, with "humps" and with "bustles," so that no one knows what is the actual rate which many concerns are paying and no one can tell whether one section is prepared to make an equal concession with that of its neighbor.

Until we have a uniform system of measurement which will make comparisons possible we shall be unable to tell if in one section an equal measure of advance is made with that in another region. Suspicion is bred by such doubt, and unfriendliness follows among the operators. When one operator was told that he could afford to grant an increase if West Virginia made a similar advance, he replied: "Well, how do I know that West Virginia will grant it, and if they promised to do so, how would I know whether the promise had been kept? They have such an irregular method of measurement that nothing is certain except that it is impossible to tell just where we stand."

It is hopeless to expect that West Virginia will ever give as large a wage as the states to the north and the west. It must continue to have low wage rates if it is to expect to keep the markets it holds, and it certainly cannot afford to lose them. But it can give every assurance that it will stand abreast with the other states in all their advances, and the neighboring commonwealths cannot feel satisfied till the rates are based on the ton rate, unless of course all increases take the form of a day-wage bonus.

West Virginia will never acquire a large home trade which will utilize its own coal. It is not like Alabama, which is likely to absorb its whole production and which even now purchases much of its own output. The wage rates in West Virginia must therefore always be low if it would keep its men at work. But there is no reason why it should not figure its wage on such a basis that everybody can tell what its advances in rate really are. The state has little to hide. Its wage rates are the natural outcome of its economic position. So long as there is a mystery as to what these are the unfriendly feeling will persist which it is so desirable to remove.

It may be permissible here to quote H. P. Howland's story in illustration of the situation:

> A dog was barking loudly at a boy and giving every evidence of being about to attack him. The man remarked to the boy, "Oh, go ahead, he won't bite you." The boy said, "I know it"; the man, "Well, why don't you go ahead?"; the boy, "Well, you see I know it and you know it, but the question is—does the dog know it?"

The union knows that West Virginia will raise its rates as fast as the unionized states, the operators in those states admit that if it wants to keep its men and avoid dissension all parts of West Virginia will have to do what some parts have already done and others have agreed to do, but though everybody is quite sure of these facts—does West Virginia know it?

The New Anthracite Sizes

There seems to be a lack of authoritative information as to the exact intention of the anthracite-producing companies in reference to the regrading of the sizes of coal. It had apparently been decided to combine egg and stove coal, making a new size to be known as "furnace," and another as "range" from the blending of chestnut and pea, but the Philadelphia & Reading Coal and Iron Co. and the Susquehanna Coal Co. have denied emphatically that they intended to abolish the production of pea coal. So certain were many of the retail dealers

in Philadelphia that the change would become effective soon that they have been advising their customers to put in pea coal now for next winter and in addition have stocked this size themselves.

It is now understood that instead of there being only four sizes of coal as compared with eight formerly, there will really be five, the last being known as "steam," a combination of pea and buckwheat sizes. This grade will be particularly adapted to domestic heating systems. This arrangement of the new sizes seems to be the most reasonable one. In the first place it is well known that pea coal, because of its comparatively low price, is extensively used in cooking stoves, when as a matter of fact it is not at all adapted to that purpose. Under the new arrangement these consumers will procure a most satisfactory fuel for range service. The new size will likely be sold at a higher price than that they formerly used; but this increased cost will be offset by the much cheaper "steam" size for their heating systems.

In fact it now appears that a difficult problem is well on the way to a solution. It has been practically admitted that the companies will have to pay an increased price for labor, and it will now be possible by this regrading of sizes to receive an increased revenue without imposing an unreasonable burden on the numerous small consumers, and at the same time give them a very much more economical and satisfactory fuel.

The recent advance in the stock of the Reading company in an otherwise dull market seems to substantiate these conclusions. According to rumor current at the time it was reported that this advance was due to the favorable working out of a situation that threatened for a time to seriously impair the income of the coal companies. The position of the company was further strengthened by reason of the fact that in regrading the sizes the carrying roads would be enabled to recoup a fair proportion of the losses due to the reduced freight rates which are to become effective Apr. 1. This saving will be effected by the roads receiving the prepared-size rates on the heavy tonnage that was formerly shipped as pea coal.

Although this complex situation now seems to be working itself out to the ultimate benefit of the consumer, there are still certain newspapers which continue to view with suspicion any act of the operating companies. True to their kind as usual, and without a clear knowledge of the question, these papers are endeavoring to foment public prejudice against the efforts of the mining companies to work out their economic salvation along the lines of sound business practice.

Ideals for College-Made Men

The Carnegie Foundation for the Advancement of Teaching has written to all the members of the four great engineering societies, the American Chemical Society, the American Institute of Chemical Engineers and the Society for the Promotion of Engineering Education asking them to supply information as to the qualifications producing success in the engineering profession. The persons thus addressed are asked to rank six groups of characteristics in the order of their relative importance. These are:

1. Character—integrity, responsibility, resourcefulness, initiative.
2. Judgment—common-sense, scientific attitude, perspective.
3. Efficiency—thoroughness, accuracy, industry.
4. Understanding—of men (executive ability).
5. Knowledge—of the fundamentals of engineering science.
6. Technique—of practice and business.

The question is put in the baldest possible way. It is as if one should ask, "Which is the most useful—a pick, a shovel, a piece of dynamite or a plow?" The answer is, of course, they all have their place. Character is certainly needed for management, and efficiency is the main need of the man in the office. The man in the field needs the fourth qualification—an understanding of men—and requirement No. 5—knowledge of the fundamentals of engineering science—is demanded most of chief engineers, while the last characteristic—technique of practice—will fit his subordinates well.

We may struggle as we will against the idea that there is a state of life to which we are in large degree called. A shovel is not called to dig, nor a pick to load earth into a barrow. So also there is a peculiar fitness in every man; there is a place where he is best suited.

We say this is an age of specialization; a man cannot know everything well. But that is not the only reason for specializing; the paramount reason is that men of one type of peculiar fitness rarely possess the other qualities or even care to exercise them. Men are specialized, not by choice nor even by training, but by birth.

It does not follow from this that the son of a man with qualification No. 4 is necessarily to be found with that characteristic a predominant element in his make-up. Character may be his leading note and not the understanding of men. Nevertheless, to a large extent birth does determine whether a man shall be a great executive, a clever engineer, a reliable office hand or a shoveler of clods. It is so inevitable that, despite all we may do to train certain young men for responsible positions, we cannot fit them to fill them. We cannot graft a new nature on these young men as we would a limb on the stock of a tree.

But if every man has a calling which he may not at his own risk refuse, it does not follow that some are honorable and others without honor. This is where the doctrine of calling and fitness has received its most painful jolts. So long as we regard management as the most worthy of employments and give it the highest pay, we shall find everyone convinced that he is admirably fitted to be boss.

The Foundation for the Advancement of Teaching should know without inquiry that character, as the foundation defines it, is the basis of management and brings at present the largest award. What has to be learned, and it may take more time than one generation to instill it, is that after all is said our low estimate of the last four qualifications arises from the centuries when democracy was unknown. If we can break away from these notions, we shall regard labor and skill in mechanics with much greater respect than they receive at the present and shall cease to ask which is the noblest note in the gamut of human characteristics.

A college can make a product out of suitable materials. It cannot be blamed if it fails to produce a man of value in the technical professions out of a boy who has no proclivities except for baseball or pink teas. No manufacturer can make a keg of nails out of a side of leather, and by no psychological miracle can a man of merely physical perfection be turned into a leader of men or a technician of skill. Nor can an ambitious hen by diligence in laying make chickens out of the eggs of a duck.

Sociological Department

What Is First Aid?

By Fred B. Kilmer*

The editor of *Coal Age* has submitted this question, What is first aid? Perhaps I can answer the query in part by stating what first aid does not embrace.

First aid in emergencies does not include the diagnosis and treatment of disease, the application of therapeutics or the practice of medicine or surgery. Persons skilled in all of these arts may practice first aid, but in practicing and in applying these arts they are not exercising true first aid according to its correct definition.

As a matter of fact many eminent practitioners of medicine misunderstand the true meaning of first aid and either condemn it or, in practicing it and in imparting it to others, overstep its true sphere. Modern first aid as applied in the factory, workshop, mine, store, household or wherever it may be needed in simple life is a complement to first aid on the battlefield.

First aid to the injured from the viewpoint of the industrial worker has been aptly described as a bridge between the accident and medical and surgical assistance, and this bridge should always be kept in mind when speaking of first aid or when applying it. Over this bridge the injured person is to be carried from the place of injury to a place of treatment, and once the bridge is crossed and the injured person is placed in the hands of a medical attendant or in the hospital, first aid is at an end. Thus we see that the true office of first aid is to relieve the injured person from immediate suffering and to prevent further injury.

First-Aid Work Does Not Include Diagnosis

Action of this character is first aid, whoever may render it. A person trained to this end, such as a mine worker who has had special instruction and who is perhaps a member of a first-aid team, a physician or a nurse, may render such aid more skillfully than an untrained person, but in either instance the action here outlined is first aid in its beginning and in its end. It will therefore be seen that the permanent treatment and care of injuries, administration of medicine, the diagnosis and treatment of disease are not parts of first aid, and it is for the lack of a clear conception of that work as here outlined that much prejudice has arisen against the movement, and first aid has failed to make the progress to which it is fully entitled. In short, it has been overloaded and complicated and what it needs at the present time is to be stripped of the nonessential and brought down to its first and underlying principles.

The great apostle of first aid, the immortal Von Esmarch, invented the well-known triangular bandage, which is simply a triangular piece of cloth. This was used by him as the sole application for rendering first aid on the battlefield, and today efficient aid can be applied in all walks of life by the use of one of these simple pieces of cloth. Indeed, there are many systems in successful operation in the railways, mines, industrial institutions and in the armies and navies of the world the beginning and ending of which consist of the well-known first-aid packet which contains this triangular piece of cloth, a bandage and a few safety pins. There are few injuries encountered in the ordinary walks of life which cannot be treated with this simple application. In other words, the triangular bandage, or at times the first-aid packet, is all the first-aid worker really needs. Thus we see that even the hospital is out of place in mine or factory as an essential part of a first-aid equipment. In fact, it would be my judgment that a hospital should not be installed as a part of the equipment unless it is also supplied with a skilled staff of physicians, surgeons and nurses. The best use for a hospital in industrial institutions is as a place for rest and the rendering of medical and surgical treatment. It should be kept locked and made inaccessible except to a qualified attendant.

In France a Pad and a Triangular Bandage

Experience in France during the present great conflict has shown that the most successful application of first aid is the covering of the injury with a pad and the application of the triangular bandage, leaving all other manipulation of the injured person for skilled attention at the hospital, which may be many leagues away.

Complications have arisen in first aid by reason of the various laws and regulations enacted by overzealous but unenlightened legislators. Hence we have a law in one state which requires a first-aid equipment containing a given number of items, sometimes including dangerous and poisonous medicines and applications; on stepping over the line we meet another set of laws and regulations requiring an entirely different outfit. The legislation as to what should constitute a first-aid equipment passed by the State of Illinois marks what should be specified, though perhaps it is a minimum requirement. That state has prescribed that at least six regulation first-aid packets be provided for train service.

Owing to the misconception of true first aid and to the complicated systems which have been introduced in mines and industrial institutions, many men who might otherwise render efficient first-aid service have become scared at the complicated array of equipments, rules, regulations and instructions, and in consequence do nothing. Others, having acquired a little but dangerous knowledge, overdo the matter and become involved in the whole realm of diagnosis, treatment, therapeutics, medicine and surgery.

The point which I have attemptd to impress in this article is that we should simplify our first-aid equipment and our instruction, service and application. The first aim is the immediate care of the injured in order that no extension of the injury may take place; the second aim is to transport the injured person as soon as possible

*New Brunswick, N. J.

and place him in the hands of a skilled medical attendant. This is where first aid becomes an adjunct to safety first—safety to the injured person, safety in the method of handling the injured person, safe transportation to a place where the injured person may receive proper treatment.

Sociology as a Profession

A few persons naturally disposed to organization have recently taken up sociology as a profession. Most of these persons are either with the Y. M. C. A. or some corporation, but a few are prepared to undertake to coördinate the work of several companies, to give the worthy projects of any concern the necessary start or to act in the capacity of an adviser.

Charles L. Fay, who was formerly at the head of the mining department of the Y. M. C. A., has decided to return to sociological work unattached to any organization. He will be a specialist in mining-town sociology and welfare work. And this does not mean that he will advise only and record what is being done, but he can do it himself. Too many sociologists would find themselves entirely out of place in a crowd of miners. But not so C. L. Fay. He has the energy of conviction and the power to make other hearts vibrate with his.

It will be his work to organize and supervise institutes, to train leaders for local supervision, investigate social conditions, promote safety and welfare meets, campaigns and rallies, mold welfare work to suit local conditions, conduct publicity campaigns, furnish lectures, initiate membership contests for local institutes and welfare associations, and provide for the systematic distribution of printed matter on welfare and social betterment.

All of which sounds like many another project which has fallen through and been discredited. But success lies in the man rather than in the scheme, and Fay has done so much meritorious welfare work that his success is assured. His address is 1206 Fulton Building, Pittsburgh, and he retains an office at Wilkes-Barre, Penn.

Hospital Management

A new publication entitled *Hospital Management* is to be published at Louisville, Ky., and the first issue has already made its appearance. A leading feature in the magazine is a department covering industrial hospitals. It is announced that this will be a permanent and important part of the publication, the idea being to record developments in the rapidly growing field of welfare work. The leading article in *Hospital Management* for February describes the hospital of the Youngstown Sheet and Tube Co., which was recently opened with Dr. Sidney McCurdy in charge. The office of the publication is at 1405 Starks Building, Louisville, Ky.

To Be Explosive, Coal Dust Must Be Very Fine and Very Dry—The inflammability or explosive property of the dust is a matter of degree, depending upon purity, fineness, dryness, quantity, volume of air and many other conditions. Coal dust increases the violence of an explosion when present with a small percentage of firedamp, and under certain conditions it is capable of initiating and extending an explosion by itself. In the opinion of A. M. Henshaw, as given in Royal Commission evidence, coal-dust explosions are generally the result of irregularity or carelessness in the use of explosives or safety lamps. If the ignition of firedamp thus caused can be prevented he thinks the dangers of coal dust will be minimized.

Th' Evidence in th' Case

A drink? I hate to do it, but I'll have t' turn you down,
Y' see I ain't touched booze since prohibition came t' town;
No, you'll find no winglets sproutin' out my shaggy shoulder blades,
An' there ain't no use of shoutin' round you think that I'm afraid.
You get me, yes? Well, youngster, drape yer frame on that settee,
An' I'll educate yer system to a daily dose of tea.

It seems you're slightly misinformed regardin' minin' life,
You think it's days of slavin' an' it's nights of booze an' strife;
You've read too much of shootin' irons and gamblin' palace dope
An' scenes of fightin' frenzy down at Tony's "Miner's Hope."
You pikers from th' city need injected in your skin
Some first-hand information on th' place we're livin' in.

Of course, when I was younger, things were lively now and then,
An' in my time I've seen some stunts would startle Christian men;
In fact, this here preparedness you read of nowadays
Was fairly well developed hereabouts in many ways;
It wasn't jist a case of being ready at th' call,
But ready all th' time, an' ready first, or not at all.

'Twas booze that kept th' fightin' flame a-burnin' hot an' bright,
'Twas booze that made our town a hell o' fury every night;
But now, my son, jest cast yer lamps about our town and see
The antiboozin' evidence of what a town can be.
Th' companies has done it, an' it's paid 'em in th' main,
By havin' sober miners in th' workin' shaft an' vein.

I ain't no Aunt Priscilla, ner sky pilot in disguise,
But a hard-boned mountain miner with a knack of gettin' wise;
No sentimental sister squeezes tears from out my hide,
'Twas common-sense that switched me to th' prohibition side:
An' sizin' up th' camps I know where booze replaces brains,
I've found them runnin' shy in loadin' ore on outbound trains.
—Frank Adams Mitchell, in "Mining and Engineering World."

Recent Legal Decisions

Liability for Injury from Falling Rock—An Alabama coal operator is liable for injury to a miner resulting from fall of a rock from above a roadway, if the injured man was not empowered or had been forbidden to put up cross-collars to support the rock. (Alabama Supreme Court, Thompson vs. Warrior River Coal Co., 69 Southern Reporter, 76.)

Scope of Rights Under Leases—A lease which plainly restricts the lessee's rights to use of the premises in prospecting for and mining coal and asphalt implies an agreement on his part that the land will not be used for any other purpose. (United States Circuit Court of Appeals, Eighth Circuit; Sharum vs. Whitehead Coal Mining Co.; 223 Federal Reporter, 282.)

Damages for Unlawful Injury to Business—The sum of $23,000 is not an excessive award of damages against persons who are found to have unlawfully conspired to destroy a coal dealer's business, when it appears that he had earned $13,000 annually just before the wrongful acts complained of. (Nebraska Supreme Court, Marsh-Burke Co. vs. Yost, 153 Northwestern Reporter, 573.)

Responsibility for Injury to Employee—A coal and dock company engaged in unloading a coal-laden boat is liable for injury to an employee of another company who was engaged at work on the side of the boat and under the unloading rig, caused by dropping of coal, if the coal company knew of the likelihood of coal dropping from the rig and started unloading without notice to the injured man, although his presence on the side of the boat was known. (Wisconsin Supreme Court, Taylor vs. Northern Coal and Dock Co., 152 Northwestern Reporter, 465.)

Correction—In our issue of Feb. 26, p. 380, under the caption "Interesting Fatality Figures," a table was printed showing the fatal accidents and production of 10 large coal companies in West Virginia. The figures given in this table refer to the fiscal year 1915 and not the calendar year, as stated.

Discussion by Readers

Thrift Among Miners

Letter No. 2—Much has been said recently, in the columns of *Coal Age*, in respect to making the miner more thrifty in his daily life. Reference has been made to the lack of banking facilities in small mining towns, and this was described as one reason why miners fail to save their earnings and accumulate property and a degree of wealth.

There is another factor that enters into the miner's welfare problem, and that is the high cost of living. This is a matter that we may expect will be taken up by miner's organizations in a way that will demand attention. It has become a vital question to millions in this country. It not only places the luxuries and many of the enjoyments of life beyond the reach of a large number, but deprives a still larger number of the absolute necessities of life.

The solution of the question is related directly to the matter of the personal efficiency and thrift of the individual. With the hope of throwing some light on this important subject, permit me to offer a brief analysis of what is a very complex problem. Its careful consideration may help to show any unprejudiced mind the real cause of the high cost of living in a way that will meet the actual conditions existing in individual lives. The factors that enter into the problem and are chiefly responsible for the high cost of living may be briefly analyzed as follows:

1. Economic expenditures or such as contribute to efficiency; for example, such items as rent, food, clothing light and fuel, together with the necessary expenditures for health, recreation, amusement, education and religion.

2. Unnecessary expenditures for drink, luxuries, amusements, dress and other supplies and modes of living that have for their sole object the maintaining of a certain social standing. These may be rightly described as extravagant and wasteful.

Family Expenses Analyzed

The rightful expenditures of a family are of two general classes—individual and social. Some of these are necessary, while others are wasteful and extravagant. The individual can seldom exercise more than a limited influence or control over social expenditures. As a citizen among citizens, he should strive to create a wholesome public sentiment in his community in this regard.

Likewise, of the individual expenditures some are necessary while others are extravagant and wasteful. But these must be determined by the individual judgment. However, a glance at the following items cannot fail to show the great waste and extravagance of individual means. The following items show the expenditures for luxuries by the people of this country in a single year, as taken from official reports. For example, chewing gum, $25,000,000; soda water and soft drinks, $325,000,000; candy and confectionery, $87,000,000; intoxicating drinks, $1,700,000,000; cigars and tobacco, $350,000,000; automobiles, $600,000,000. I might suggest adding to this list for theaters, movies, etc., say $600,000,000, and for banquets and dinners at hotels and restaurants and for tango teas, say $400,000,000.

We must admit that this is an imposing list of expenses that are largely unnecessary and do not contribute to the individual efficiency and thrift that go to make success in life. The grand total amounts to about $40 per capita, or $200 per family per annum, which is practically one-fifth of our total expenditures for the same time. It goes without saying that all can do something toward reducing this unnecessary waste and turn money into more useful and productive channels.

In the popular discussion of the high prices asked for the necessities of life there are a great variety of forces operating to determine the market prices of these commodities, but they can be classified under three general heads; namely, conditions that restrict the supply or increase the cost of production, conditions that produce an increased consumption of the products and conditions that alter the money standard and affect values.

I have given this brief analysis for the purpose of presenting clearly the chief factors that determine the individual living expenses and have incidentally revealed some of the sources of waste and extravagance. But as a question of personal efficiency and thrift, every individual must analyze for himself the economic forces or tendencies and conditions that prevail in his own problem of life.

Mystic, Iowa. William James.

A Puzzle in Mining Costs

Letter No. 1—Being in charge of a mine where the seam is 24 in. and less in thickness, running as low as 18 in. in places, and the working face being 1¾ mi. from the shaft bottom, I was naturally much interested in the article of J. F. K. Brown, *Coal Age*, Feb. 5, p. 246, and note that he asks for a discussion of mining costs under similar conditions to those he has described. Believing that my experience will be of value in this connection, I submit the following:

In order to bring the output of coal up to the desired tonnage, it would seem necessary to install electric power at this mine and use cutting machines and gathering motors underground. I favor the room-and-pillar method of mining in preference to the longwall system in this case, and would suggest driving the entries 15 ft. wide and taking up 3 ft. of bottom to gain the necessary headroom in the roadways. Use one row of props along the side of the road and fill the space from the road to the rib with dirt taken from the bottom. This plan will save much timber.

Leave only small pillars between the entries, say 5 ft. in width. Turn the rooms on 30-ft. centers and make the road in the center of each room, standing a row of props on each side of the road. Leave small pillars between the rooms, say not exceeding 4 ft. in width. Shoot 20 in. of bottom on the roads in the rooms, which

will bring the top of the car down near the bottom of the coal and greatly facilitate the loading of the cars.

Undercut the coal with 36-B Jeffrey machines, these being the lowest type of longwall machine on the market—only 14 in. in height off the truck. One of these machines will cut 50 tons of coal per day in rooms and more on a longwall face, in 15-in. coal. Use electric coal drills and rock drills at the face. Also, use small gathering motors for collecting the cars at the face and making up the trips to be hauled out of the mine.

If this plan is adopted, I would estimate the cost of mining as follows, based on an output of 50 tons per day:

Cutting coal, two men at $4	$8.00
Loading coal, 50 tons at 60c. per ton	30.00
Shooting bottom, main entries, 36 in., 2c. per ton	1.00
Shooting bottom, cross-entries, 36 in., 10c. per ton	5.00
Shooting bottom in rooms, 20 in., 25c. per ton	12.50
Hauling coal, 50 tons at 15c. per ton	7.50
Weighing and handling coal, 50 tons at 10c. per ton	5.00
Hoisting coal, 50 tons at 6c. per ton	3.00
Timber, say 5c. per ton of coal	2.50
Management, say 15c. per ton of coal	7.50
Repairs and renewals, say 10c. per ton of coal	5.00
Fuel, power house, 4 tons at $2.55 per ton	10.20
Total	$97.20

I would therefore say that the total cost of mining and loading 50 tons of coal, on this basis, would be $100, or $2 per ton, which would leave a profit of 55c. per ton. I imagine this would be satisfactory to the parties operating the mine, as it would leave a gross profit of about 25 per cent. on the capital invested.

Bay City, Mich. ALEX JEFFREY.

Letter No. 2—I have read the interesting article by J. F. K. Brown, *Coal Age*, Feb. 5, p. 246, entitled "A Puzzle in Mining Costs," in which he asks for a discussion of the costs that can be expected in mining coal under the conditions he has briefly described.

It would be a bold man indeed who would venture to prophesy the cost of getting out coal, even at a mine where he is practically familiar with all the existing conditions. And the best one can do in estimating the probable cost at a mine of which he has only a brief description is to guess twice and divide the sum of his guesses by two, with the hope of reaching a somewhat doubtful conclusion. There are, however, certain features in connection with the tentative costs advanced by Mr. Brown that will bear discussion even by one who is unfamiliar with the conditions.

The first point that strikes one is the assumption that a successful mechanical haulage has been installed and there is no charge against operation, either for interest or depreciation. The tonnage required is low, only 50 tons per day, which most of us would consider too small an output to sustain the necessary charges to which I have referred.

Conditions Affecting Cost of Operation

However, let me assume, first, that this mine is worked on the room-and-pillar system and that the hoisting engine is replaced by an endless-rope haulage engine and located on a trestle connecting the mouth of the slope with the tipple at the railroad, and that the cars are hauled from the inside of the mine to the tipple and dumped directly into the railroad cars. The miners must load their cars and deliver them at the room necks.

Now, assume the average output per miner is 2 tons of coal per day and the mining costs, say $1 per ton, to which must be added the 33c. for rockwork given in Mr. Brown's estimate, making a total of $1.33 per ton of coal mined. There will probably be needed two pushers at $1.50 each, one gripper at the bottom, two men and an engineer on the outside, at a total expenditure of $10.50 per day, or 21c. per ton of coal loaded. To this must be added the cost for a fireman, $2.50 per day, or 5c. per ton, and for management, say 8c. per ton, making the total cost of mining and loading, $1.67 per ton.

The cost for supplies is generally estimated as about one-seventh of the total cost of operation, which gives, in this case, $1.67 $\times$ $^7/_6$ = $1.95 per ton as the total cost of operation. This makes the cost for supplies, $1.95 $\div$ 7 = 28c. per ton of coal mined. This estimated cost of supplies should cover the outlay for timber and fuel for the boilers. Mr. Brown has apparently omitted charging these items of expense.

The interest on repairs and improvements, based on 300 working days, at 50 tons per day and 8 per cent. interest, should be amply covered by an estimate of 2c. per ton of coal mined, which would still further increase the cost of operation to $1.97 per ton. Since we are only guessing, in this case, we may as well add a slight margin and call the total cost of operation $2 per ton of coal mined, loaded and shipped.

Economy of a Face Conveyor

In respect to the longwall system of mining, it would seem that a small face conveyor would pay for itself in a short time. This would cut out the necessity for the two pushers at the inside and cause a saving of $3 per day, which for 300 days would make a total saving of $900 per year, or say 8 per cent. on an investment of $11,250. Truly, if a face conveyor could save this amount, it would be a profitable investment.

In my estimate I have made no charge for depreciation, pumping, blacksmithing, carpenter or other work, except as these items come under the general charge for repairs and improvements. The amount required for these purposes can only be determined by a full knowledge of the local conditions and must be added to the figures given above. My estimate, as I have already indicated, is not to be taken as correct, but merely a guess in the dark, given for the purpose of stimulating ideas and discussion on such an important question in the mining of coal. J. B. DE HART.

Coalhurst, Alta., Canada.

The Miner and "Safety First"

Letter No. 5—I was much interested in the striking foreword that appeared in *Coal Age* of Feb. 19. The foreword impersonated "Carelessness" and illustrated clearly the heavy toll it exacts of all connected with the coal-mining industry. I cannot assume that the foreword was written for this issue, on account of the contents of the pages that follow it, but it would seem a most curious coincidence that a glance through the pages reveals so many references to the general subject of "safety first."

While I do not need to quote the words of the foreword to which I have referred, it seems to me that too much is imputed to carelessness on the part of those engaged in mining. The word "carelessness" does not convey the whole truth. For example, turning to page 348 of the same issue, Ostel Bullock mentions an incident where

a man was severely burned, not as a result of carelessness on his own or anyone's part, but rather the reckless disregard for the safety of others on the part of one and a fear of being called a "snitcher," on the part of Mr. Bullock himself, whose moral courage was unequal to the occasion; and instead of performing what was clearly his duty, he left the mine, abandoning his fellow workers to their fate. I am glad to note his statement that he will never allow himself to act in the same manner again. Such fear on the part of mine workers is itself the most positive danger there is in the mine—I mean the fear that would prevent any man from revealing a danger that he knows to exist. The slogan "safety first" has no possible meaning with a man who harbors such a fear that would prevent him from acting promptly and defiantly in an emergency where life is in danger.

Replying to the second question asked by the same correspondent, on page 349, in regard to a suggestion of a double-acting, self-closing door that could be opened from either side by a mule, but that would not be blown ajar by the force of the air current, permit me to say that my judgment would be to alter the ventilation of the mine in such a way that no door would be required at that point, which I understand to be a dangerous place; and in the interest of safety first, there should be no guesswork in respect to the constancy of the ventilation.

Again, turning to page 333, of the same issue, commenting on the Ernest mine explosion of Feb. 11, 1916, the statement is made that "it is doubtful if investigation, as thorough as it will be, will ever reveal the real cause of the disaster." Permit me to ask, Does it not seem after reading the instances of the failure to recognize the true meaning of safety first to which I have referred that criminal carelessness may have caused the loss of the 30 lives sacrificed in that explosion? Perhaps some cowardly act or fear of being called a "snitcher" is responsible here also for those terrible results.

SAFETY FIRST AND ALWAYS.

Vancouver, B. C., Canada.

Efficient Mine Foremen

Letter No. 30—I do not wish to prolong the discussion unnecessarily, but feel that such a letter as No. 15, *Coal Age*, Jan. 1, p. 24, written evidently by a Pennsylvania mine foreman, should not be allowed to pass without comment. The letter conveys the impression that mine foremen often prove to be sneaks and liars. Since the mine foreman holds a responsible position, one would naturally infer that many coal companies approve of such alleged action on the part of their foreman and call the man efficient.

The letter certainly holds out a very discouraging prospect to an honest man when it states that "the mine foreman who hides gas or other dangers found in the mine from the inspector is the one who stands the best chance of holding his place and drawing the highest pay." I am glad to say that all foremen are not of this type. Such a man is not fit to hold his position, which is the most responsible place in the mine.

In my opinion, although there are many hard propositions for the foreman to settle and avoid trouble, the best way of doing business is to be honest and fair with both the company and the men. I believe that honest dealing with the operator, the inspector and the miner will make a man more successful than to attempt to hide what he knows to be wrong.

We often hear it said that coal miners are a class by themselves. Newspaper and magazine articles often represent the coal miner as a dangerous citizen. They are written by persons who know nothing of mining camps and conditions existing in them, but such a letter as that to which I have referred would seem to bear testimony to the truth of their statements.

Referring to the bread-and-butter side of the question, I want to say that mine foremen of moderate salary know there is little hope of increase in that direction, unless they can make a big showing in the output of coal or cost per ton. There are foremen who will take chances to accomplish this and disregard both mining laws and safety in order to make a big run. Then, when the inspector comes around, such a foreman is tempted to hide his misdoings so that the law will not catch him. Too often the bread-and-butter question means automobiles and summer vacations, with lack of attention to the duties of the foreman in the mine.

WORTH OF MINE FOREMEN; HOW DETERMINED

It is true that many foremen are worth more money than is paid them. When that is the case, the foreman should go to the superintendent and ask for more pay and be ready, if this is refused, to take up the pick and start to dig coal, which will enable him to earn the pay he asks. By so doing, a man shows what he is worth, but many foremen think it a disgrace for them to stoop to dig coal after having filled the position of foreman in a mine. I will say, however, it is more honorable to dig coal than to work for less than your labor is worth.

Could the writer of Letter No. 15 have seen "the curse in a dead man's eye" referred to in "Extracts from a Superintendent's Diary," *Coal Age*, Feb. 5, p. 252, as did the two men referred to in that article, I am sure he would try either to rectify his wrongdoing or would tender his resignation and seek work elsewhere so that he would not be confronted daily with the scenes of his error. I believe, however, that the look in a dead man's eye would still follow him to the grave.

I am happy to say that I am working for one of the most efficient mine foremen in this region. My instructions are, "Take no chances with any danger at any time, even if it should hold up the output from the entire section in your charge." I report all dangers observed each day, and I have yet to find that these have not been removed, as far as possible, by the following day. Our foreman is honest and tells the superintendent and the inspector any danger that may exist and what steps he is taking for its removal. A new scheme he has adopted to secure greater efficiency in his assistants is to have them accompany him and the mine inspector when the latter makes a round of any assistant's section in the mine. This leaves no loophole for excuse, and I believe is proving a success.

In closing I want to refer to an explosion that occurred a few years ago in which the evidence showed that the foreman sealed off a pair of entries generating explosive gas without reporting the same to the inspector, who knew nothing of this being done. Later, the foreman tried to make his way through those entries with

an open light, which ignited the gas and caused the explosion, killing the foreman and 33 men at work in the mine. This foreman paid for his wrongdoing by the sacrifice of his life. I hope I have shown that it does not answer to hide any danger existing in the mine.

Cleaton, Ky. OSTEL BULLOCK.

Letter No. 31—After reading letter No. 24, by L. J. Wright, *Coal Age*, Feb. 5, p. 264, in which he takes exception to the statement made by a previous writer to the effect that "the bread-and-butter question has generally a lot to do with the mine foreman's actions," I am moved to say that the bread-and-butter question certainly does have a lot to do with the mine foreman's actions. My observations for over 11 years convince me that this is the cause of many mine foremen hiding wrongs and existing dangers from the mine inspector. I cannot, therefore, indorse the views expressed by Mr. Wright when he says, referring to this statement made in Letter No. 15, Jan. 1, p. 24, "Had the writer of that letter witnessed the scenes of the Palos mine explosion . . ." he would never have written the statement quoted above.

In concluding his letter, he remarks, "We all know there are foremen who have little knowledge in regard to running the mine in their charge, but I will eat my bread with no butter rather than be the cause of making widows and orphans by hiding gas or other dangers that I know exist in the mine."

I want to indorse these sentiments and to say that my plan has always been to expose any known dangers existing in the mines. I first acquaint the party responsible for the condition, and if no action is taken to remove the danger I at once proceed to take the matter up with higher authority. This has not always been an agree able task, and I have realized what it means to eat my bread without butter, because of having adopted such policy, which I have considered my duty.

I believe that it is, likewise, the duty of every mineworker to expose a danger known to exist in the mine and to urge its removal. I believe that every mineworker should be on the alert to discover danger and report the same. The true efficiency of the "safety-first" movement will never be realized until everyone working in the mine follows this policy. W. H. LUXTON.

Dugger, Ind.

Immigration in the Future

Letter No. 4—I have read with much interest the discussion in *Coal Age* in regard to foreign immigration in this country when the European War is ended and the effect it will have on American labor and commerce. It appears to me to be rather a difficult undertaking to offer suggestions at this time that will throw any considerable light on this question, to say nothing of affording a satisfactory solution to the problem.

Various opinions on this question advanced by eminent authorities differ widely, and consequently are of value only as opinions and not facts. One may draw upon his imagination as to what conditions will prevail in this country in respect to labor and commerce at the close of the war, but the real conditions may be very different from what we picture them. Consequently, our conclusions can hardly be more than mere conjectures. In my opinion the conditions that will confront us in regard to labor and commerce when the war is closed can be considered now only as assumed conditions and not real.

However, in studying this question we may take into account some of the conditions that we know will exist in Europe when the war is ended. First, we know that millions of her able-bodied sons of toil will be sleeping beneath the sod. Second, her finances will be exhausted, and she will be as poor as the traditional "Job's turkey." Third, many of her industries will be destroyed, farms devastated and cities ruined. But facing this state of affairs, we do not know how quickly or to what extent the governments of Europe will be able to revive their industries and recover their losses in business.

It is thought by some that, if the war continues long enough, this country will learn to manufacture many articles heretofore not attempted. With millions of Europe's able-bodied young men dead and many of her manufacturing plants destroyed and her commerce greatly crippled, while the manufactories here are well equipped with improved machinery and supplied with expert labor, the question is, Will Europe ever again be able to compete with the United States in the markets of the world? The industries that have sprung into existence in this country to manufacture articles that could not be imported during the war have enjoyed great prosperity, and when the war is over that prosperity will perhaps be much increased and they will need an increased force of workmen. Are these here? And if not, where are they to come from? There will undoubtedly be much rebuilding to be done in the war zone of Europe when peace is concluded, and America will be in a position to render great assistance in the way of furnishing building supplies if she has a sufficient labor force.

THE REAL QUESTION TO BE SOLVED

It occurs to me, as indicated by William James, in his letter No. 2, *Coal Age*, Jan. 29, p. 219, that the question to be solved in this country, at the conclusion of the war, will be how to obtain enough labor to sufficiently operate our industries to meet the great demand that may be expected to arise for American products. There is little to be feared in respect to there being then a surplus of labor by reason of foreign immigration in this country. It is thought by some that, to escape the burden of heavy taxation that will follow the close of the war, many hundreds of workmen will come to this country. It is no doubt true that, as has been suggested, taxes in that country will be excessively high, but other conditions will have so improved that high taxes will not rest as a burden on the laboring classes.

I am of the opinion that this terrible war will in the end teach the European nations their folly and prove a lesson that will hereafter cause wars to be dreaded. Let us hope that, as a result of the lesson learned from such costly experience, a long and continued peace will be established, which event will bring renewed prosperity to that country and better and more desirable conditions for the laboring classes and that will not only have a tendency to keep them home in their own land, but will also have a strong tendency to draw many foreign laborers from our shores. My conclusions are that many American industries will be made to suffer more on account of the exodus of foreign laborers from our shores when peace is concluded than from an influx of immigration.

Dayton, Tenn. JOHN ROSE.

Inquiries of General Interest

Wyoming's Compensation Law

Will you kindly permit me to quote a passage from the compensation law of the State of Wyoming and ask two questions relating to its possible interpretation? The passage to which I refer is taken from Sec. 19(d), 1, and reads as follows:

> But if the workman leaves a widow or invalid widower, such surviving spouse shall receive a lump sum payment of $1,000, to which shall be added a lump sum aggregating the present worth of $60 per year, for each surviving child under 16 years of age, until the time when each of said surviving children shall become 16 years of age, provided that the aggregate sum so added on account of children under 16 years of age shall in no case exceed an amount equal to the lump sum provided to be paid the surviving spouse, etc.

The questions I would like to ask are the following: 1. What lump sum would a child get if born on the same date as the death of the father? 2. What lump sum would each child get if one was born on the date of the father's death, one a year previous and one two years previous to the father's death? I am a little curious, also, to know what interpretation would be put on this passage by different readers of *Coal Age*, as its real meaning seems somewhat vague. INQUIRER.

Kemmerer, Wyo.

It may be of interest to learn how the different readers would interpret the passage of the law quoted by this correspondent; but in order to secure first-hand information in reply to this question, it was submitted to the Legal Department of the State of Wyoming, through George Blacker, state coal mine inspector, District No. 1, and the following was received in reply to the questions asked:

1. On the supposition that the man was killed Jan. 1 and the child was born the same day, compensation would be awarded the widow, in addition to the $1,000 first provided by law as her due, a lump sum equal to the present worth of $60 per annum due 16 years hence. This amount is calculated thus: The present worth of $1 per annum due 16 years from date of accident, at the savings-bank rate of interest of 4 per cent. per annum, would be approximately $12.118, and the present value of $60 per annum, on the same conditions, would therefore be $60 \times 12.118 = \$727.08$.

2. Replying to the second question, the compensation paid for the first child would be, as explained, the present worth of $60 per annum due in 16 years, at 4 per cent. interest, which is $727.08.

For the second child the compensation would be the present value of $60 per annum due 15 years hence, at 4 per cent. per annum. In this case the present value of $1 per annum due 15 years later, at 4 per cent., is $11.563; and the present value of $60 per annum, on the same conditions, is $60 \times 11.563 = \$693.78$.

For the third child, the compensation would be the present value of $60 per annum due 14 years hence, at 4 per cent. per annum. In this case, the present value of $1 due 14 years hence, at 4 per cent. per annum, is $10.986; and the present value of $60 per annum, on the same conditions, is $60 \times 10.986 = \$659.16$.

This would make the total compensation due the surviving widow as follows: Widow, $1,000; first child, $727.08; second child, $693.78; third child, $659.16; total, $3,080.02.

The law, however, expressly provides that in no case shall the aggregate sum due the surviving widow on account of the dependent children exceed the lump sum provided by law for the surviving spouse. In the particular case assumed by this correspondent, therefore, the total amount of compensation awarded the surviving widow would be $2,000, or double the amount of her own compensation. The foregoing is the method of computing compensation awards that is in use in the Legal Department of the State of Wyoming.

One may infer also that the law provides the same compensation to be paid a spouse, dependent on the earnings of a son who has been killed in the mine, and his brothers and sisters under 16 years of age, also dependents.

Gasoline Motors in Mines

Kindly state what is the composition of the gases given off by a gasoline mine motor. There has been quite a difference of opinion in regard to the gases produced by the motor working in this mine, and we would like to see the question answered in *Coal Age*. Also, what volume of air should be traveling on the haulage road while the motor is working and in good condition? Some say 20,000 cu.ft. and others 30,000 cu.ft. per min. MOTORMAN.

La Salle, Ill.

The composition of the gases discharged from a gasoline motor is quite variable, depending not only on the load under which the motor is running, but on innumerable conditions relating to the amount of air admitted to the cylinder and the adjustment and condition of the different parts of the engine. The results are also affected by the condition of the mine air where the motor is working. These factors, which materially modify the character of the gases produced, are so numerous and variable that nothing more than a general analysis of the discharge of a gasoline engine can be given, which is as follows: Nitrogen, say 80 per cent.; carbon dioxide, say 10 per cent.; carbon monoxide, from 3 to 10 per cent. Besides these there are varying small percentages of oxygen, hydrogen and hydrocarbons, chiefly marsh gas (CH_4).

The volume of air that should be traveling on the haulage road while the locomotive is working will depend on the size of the passageway. Assuming the motor is in good condition, the velocity of the air current on the haulage road should not be less than 8 or 10 ft. per sec. in order to insure the safe ventilation of the road and avoid the risk of accident. To eliminate danger arising from a poor condition of the motor that may occur at any time, the velocity of the air current may well be increased to 12 or 15 ft. per sec.

Examination Questions

Mine Foremen's Examination, Utah, November, 1915

(*Selected Questions*)

Ques.—A seam of coal 7 ft. thick, dipping 7 per cent., is to be opened by a slope driven on the full dip. How long a time will it take, under favorable conditions, before this mine will produce 1,000 tons of coal per day? Explain how you arrive at your conclusion. Give width of entries and rooms, size of entry and room pillars, method of ventilation, and the number of men needed for this production, figured on the basis of hand mining.

Ans.—Under favorable conditions of mining, it will be safe to estimate an output of 4 tons per day per man in a seam 7 ft. thick, the men working double. For an output of 1,000 tons per day, this would require 1,000 ÷ 4 = 250 men, and working two men in a room, there must be 125 rooms. If the rooms are driven on 40-ft. centers, this will require 40 × 125 = 5,000 ft. of productive entries.

Now, assume a pair of levels are driven to the right and another to the left of the main slope, at a distance of, say 400 ft. from the slope entrance, and similar levels at intervals of 400 ft. along the slope. Practically, the first lift will be in 400 ft. when the second lift is started, and likewise each lift will have advanced 400 ft. farther when a new lift is started. On this basis, when the fourth lift has started and been driven a short distance, there will be practically 2,500 ft. of productive entries on each side of the main slope, or 5,000 ft. of entry in all.

Since entry driving proceeds regularly in all the levels as they are turned, it is only necessary to estimate the length of time required to drive the main slope 400 ft., and the first lifts, say 1,400 ft. each, making a total of 1,800 ft. continuous driving. Then, double shifting all entries and estimating on advancing 2½ ft. per shift, or 5 ft. per day, will require 1,800 ÷ 5 = 360 working days, or say for a safe estimate 400 days.

The width of entries and rooms will depend on the nature of the roof, floor and coal. But assuming good conditions of mining, the entries should be driven 10 ft. wide, and the rooms, say 8 yd. wide, with 16-ft. pillars between them. With a good roof, the entries will be driven the full height of the coal, giving a cross-section of 7x10 = 70 sq.ft., less a certain allowance for timbering. If the mine generates gas in any considerable quantity, the exhaust system of ventilation should be adopted and haulage should be performed on the intake air. On the other hand, if there is no gas, it will generally be better to use the blowing system of ventilation and haul the coal on the return air.

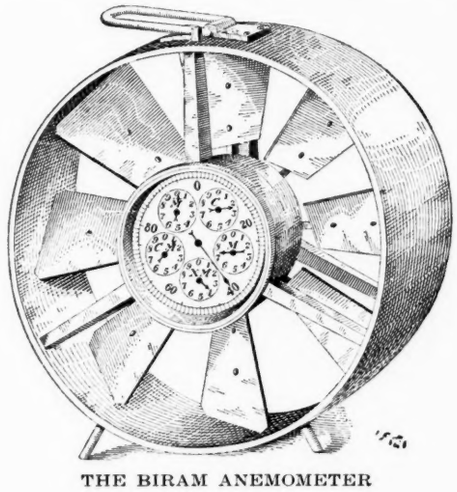
Ques.—What are the effects of a windy or blownout shot, and what precautions should a mine boss take to prevent them?

Ans.—A windy shot produces a heavy concussion of the air in the mine. The blast is very apt to throw a large quantity of dust into the air, and if this is inflammable, the flame of the explosion may ignite the dust with disastrous results. A blownout shot produces similar but greatly intensified results because of the higher pressure and temperature produced.

In order to guard against these occurrences the mine foreman should make and enforce strict regulations in regard to blasting. The safest method to pursue is to appoint shotfirers, whose duty it will be to inspect charge and fire all holes, except those that they consider unsafe. Where shotfirers are not employed, a good plan is to limit the amount of powder each man is permitted to take into the mine to what he will require for the day's use.

Ques.—Describe the anemometer and state its use.

Ans.—As shown in the accompanying figure, the instrument consists of a number of plates of thin metal



THE BIRAM ANEMOMETER

mounted in an inclined position on radial arms supported by a central shaft that is connected with a train of gears designed to register the number of revolutions of the vane on the dial. When held in an air current the vane is rotated by the passing air and the revolutions per minute, which are registered on the dial, show the velocity of the air in feet per minute.

Ques.—Assuming two airways under the same pressure, one 6x6 ft., 5,000 ft. long, and the other 8x4½ ft., 5,000 ft. long, which will pass the greater quantity of air and why?

Ans.—The length, sectional area and pressure being the same in each airway, the quantity of air passing will vary inversely as the square root of the perimeter. In other words, the quantity ratio is equal to the square root of the inverse perimeter ratio. Thus,

$$\frac{q_1}{q_2} = \sqrt{\frac{25}{24}} = 1.02$$

That is to say, the second airway will pass 1.02 times the quantity that would pass in the first airway under the same pressure. In other words, a pressure that would pass 10,000 cu.ft. of air each minute in the first airway would pass 10,200 cu.ft. per min. in the second.

Coal and Coke News

Washington, D. C.

The Federal Reserve Board in the monthly reports of business conditions from Federal Reserve agents, for March, reviews coal conditions from various districts as follows:

Philadelphia—"Coal-mining operations have been affected during the past month by the weather and car shortage. Prices have receded somewhat from the high point of the previous month. Anthracite collieries are working to full capacity. The oil business is in a prosperous condition. The price of crude petroleum is increasing, and unless the supply of crude oil is increased there will be a considerable advance in prices of refined products."

Cleveland—"Conditions in the coal trade have changed but little since last month's report. The inability of the railroads to place cars upon the sidings of the coal companies has had a tendency to restrict output and to stiffen prices. It should be understood that the present situation in the coal market is not a normal one, as numerous concerns are stocking coal in fear of a suspension, at least during the month of April."

Richmond—"Coal production shows large tonnage with satisfactory sales, both in volume and price. Grain movements show little improvement over last month, and shippers are still suffering because of terminal congestion and lack of ocean transportation."

Minneapolis—"The coal situation, which during the early part of the month threatened to become serious at many points in the Dakotas, was relieved by higher temperatures during the middle of the month. Duluth has stocks of both hard and soft coal at the docks which are believed to be ample unless there is sustained severe cold."

HARRISBURG, PENN.

The plan of the anthracite operators to produce coal in only five market sizes instead of eight, limiting domestic coal to what will be known as range and furnace sizes, is expected, if adopted, to have two significant results. The first will be to secure more money for the transportation of the coal marketed, and the second will be to make available a larger stock of coal for the uses to which anthracite is especially adapted, thereby taking it out of competition with bituminous.

The operators declare that the plan has not yet been adopted, and that it is not at all certain that it will be. The project, as it is being considered now, provides for the merging of pea and chestnut to make range coal, and the combining of egg and stove to make furnace coal. Pea coal costs at the mines about $2.55 a ton, and chestnut costs about $4.25 a ton. What price the new size will bring, the operators will not say. It may be the price of the larger size or it may be a new price between that and pea-coal price.

If the higher price is asked it is estimated that the increased receipts would be about $8,500,000 a year, as about 5,000,000 tons of pea coal would be involved in the change. Should the new price be only $4 a ton, the increase in receipts would be about $7,000,000. Similar increase of revenue would be brought about by the merger of egg and stove coal.

The new sizes would both come under the classification of prepared coal, which averages about 30c. a ton more than pea coal in transportation.

The Interstate Commerce Commission, however, has modified the anthracite-rate schedule, and the charges per ton will be about 15c. lower. This would mean an increase, even then, of $750,000. The operators, however, have asked for a stay of the Interstate Commerce Commission order.

It is estimated that about 61,000,000 tons of coal is shipped annually. Of this amount 38,000,000 is prepared sizes and about 23,000 smaller sizes. The average reduction ordered by the Interstate Commerce Commission is 15c. a ton on the prepared sizes and 10c. a ton on the smaller sizes.

The Philadelphia & Reading Coal and Iron Co. caused an announcement to be sent out from its offices in Pottsville that pea coal would not be abolished by that corporation; however, other operators say there is a possibility of the change.

What Rights Has a Consular Agent?

An interesting question, which will test the authority of the Austrian consul to authorize the employment of counsel on behalf of Austrian subjects in the filing of suits in Common Pleas court, has been raised by P. F. O'Neill, assistant general counsel for the Lehigh Valley Coal Co. Mr. O'Neill filed petitions on Mar. 2 in five such cases and secured rules on the attorneys appointed by the Austrian Consul.

On Feb. 16, 1916, five suits were filed against the Lehigh Valley Coal Co., growing out of the fatal accident at the Prospect Colliery on Feb. 17, 1915, in which 12 men were killed.

The five suits aggregate $100,000 and were certified by Paul Bukva, Austrian consular agent of Wilkes-Barre on behalf of the plaintiffs. In attacking the legality of the suits, Attorney O'Neill states in his petition: "That your petitioner is informed and believes that neither of the counsel who instituted this action ever received, directly or indirectly, in law or in fact, from the plaintiffs, or from any person to whom a right of action accrued by reason of the deaths averred as the cause of action, any warrant, power, authority, direction, instruction or permission whatsoever to institute or maintain this suit against the defendant."

The right of Austrian or other consular agents of foreign governments to represent aliens in the courts has been recently raised in Schulykill County in a case from the Orphans' Court, in which it was held that such consular agents have no rights until after the estate has been settled and passed through the county and state courts, after which any power, such as that derived from treaties with the Federal government, become effective.

The stand taken by the Lehigh Valley Coal Co. raises an important question, as some courts recognize the consular agents in damage suits. No doubt this controversy will be closely watched by coal operators throughout the state, as the Austrian and Italian Governments have several consular agents in various parts of the coal fields of Pennsylvania.

Engineers' Examinations

Recommendations that engineers, surveyors or technical men in public service where competency may be established by examination should be subject to state or municipal civil-service regulations; that there be a state board to supervise registration of technical men, are made in the report of the State Engineers' Commission presented to Governor Brumbaugh on Mar. 4. The commission was named by Governor Tener in 1914 and consisted of F. Herbert Snow, chairman; chief engineer of the Public Service Commission, John Price Jackson; chief of the Department of Labor and Industry, Samuel A. Taylor, Pittsburgh; George S. Webster, Philadelphia, and J. Murray Africa, mining engineer, of Huntingdon.

The commission has made what is considered the most exhaustive study of engineering and its practice and engineers and their relation to public work. The chief recommendation is that there should be a state board or commission to have charge of registration of engineers for practice in the state, that in first- and second-class cities the civil-service boards could conduct such examination as necessary and in the rest of the state the proposed state commission should be in charge of the tests. Consulting engineers or those temporarily engaged would not be subject to examinations. Certificates of fitness could be issued.

It is suggested that public-service companies should be exempted from the civil-service regulation until the system works out on state or other public operations; that plans and specifications for public works to be built or operated by public-service companies should be handled by proper branches of the state government and that the state board or commission in charge of engineers act in an advisory capacity on employment of consulting or temporary engineers and also have authority to investigate charges of incompetence or dereliction.

Drafts of acts to make the system of licensing engineers effective are submitted to the governor.

PENNSYLVANIA

Anthracite

Wilkes-Barre—From reports just published this, the 10th Anthracite District, shows an increase of production in 1915 of 277,778 tons, with a total of 5,017,729. There were 28 fatal fatal accidents during the year as compared with 34 in the previous 12 months, one fatality occurring for every 192,990 tons mined.

Pottsville—The tonnage of anthracite produced in the districts of this and near-by territory has fallen off considerably in 1915 as compared with that of 1914. The 15th District reports a decrease of 217,583 tons; the 16th 116,605 tons,

and the 20th 49,845. The number of accidents of all kinds show a considerable reduction, and while this is in a measure attributable to the employment of fewer men the past year, it is no doubt directly traceable to the safety regulations adopted, the efficiency of the first-aid corps and greater observance of the laws relating to the protection of the miners.

Throop—Employees of the Von Storch colliery of the Delaware and Hudson Co. went on strike on Mar. 1, about 1,000 men saying that it is impossible to make a living under the present wage scale.

Sandy Run—Miners at the Cranberry colliery of A. Parddee & Co. will receive back pay amounting to about $15,000 as a result of a decision of Umpire Charles P. Neill, of the Anthracite Conciliation Board, directing the firm to compensate them on the basis of 106.25 cu.ft. per car instead of 101 cu.ft.

Lykens—The strike of 1,200 miners at the colliery of the Susquehanna Coal Co. was settled when William Stuppy, a topping boss, whose discharge caused a walkout, was given work at another colliery. The charge of excessive "topping" will be settled later.

Pittston—The annual banquet of the Mining Institute, which has been one of the most enjoyable social functions in this city for several years past, will be held Saturday evening, Apr. 29. The committee in charge include R. A. Mulhall, William Siley, John Brown, Thomas Huntley and H. T. McMilan, superintendents and mine inspectors for the various collieries in the region. It is expected, as on previous occasions, that a thousand or more members will be present.

Shenandoah—Eight collieries of the Philadelphia & Reading Coal and Iron Co. were compelled to suspend operations on Mar. 4 for the want of railroad cars. Thousands of men and boys were out of work.

Branchdale—Wrongly placed wires caused an explosion of dynamite at the Otto colliery of the Philadelphia & Reading Coal and Iron Co. on Mar. 3. Two miners were blown through the gangway, receiving injuries that may result fatally.

Bituminous

Johnstown—The No. 4 plant of the Stineman Coal and Coke Co., which has been closed since the fan house was destroyed by fire, will shortly resume operations. The building has been rebuilt.

Beaverdale—A strike was called on Mar. 1, at the mines of the Beaver Run Coal Mining Co. More than 100 men walked out. No statement was issued.

A dozen new dwelling houses have just been completed for the Wilmore Coal Mining Co. These structures are modern and substantial.

Pittsburgh—A petition was recently filed asking that an injunction be issued restraining the proposed sale of the United Coal Co.'s properties. This action was brought by the Peoples National Bank of Laurel, Del. The United Coal Co. went into the hands of receivers shortly after the failure of the Kuhn interests several years ago. The present controversy is said to be between the bondholders and those whose claims were secured by first mortgages and the unsecured creditors.

It is said that definite steps have been taken for the formation of a new coal company in Pittsburgh which will take over practically all of the independent coal companies that operate the Pittsburgh bed of coal. It is reported that for at least 30 days negotiations have been under way, directed from New York, for the purchase of the holdings of the Pittsburgh-Buffalo Co., which is controlled by the Union Coal and Coke Co., the Pittsburgh Westmoreland Coal Co., the Pittsburgh bed holdings of the Youghiogheny & Ohio Coal Co., the coal mines of the Pittsburgh Terminal Railroad and Coal Co., and possibly the United Coal Co. and Carnegie Coal Co. properties. There has been a semi-official denial concerning some of these companies. The proposed merger would be capitalized at approximately $30,000,000.

Greenville—The Filer mine at Pardoe recently closed down because someone broke into the scale house and stole the computing beam of the scales on which is weighed coal produced by the miners. A reward has been offered for the perpetrator of the theft.

Wampum—Work at the mines and plant of the Beaver Coal and Coke Co. is progressing rapidly and operations will be begun shortly at full capacity. A new pump was installed last week and other improvements have been made. The plant has been working for some time but not at full capacity.

Barnesboro—The Lenox Coal Co., with headquarters in Johnstown, has leased the Walnut Run Coal Co. of this place. The plant, which is well equipped, has been in operation for several years and draws its product from a tract of 343 acres.

Connellsville—The Connellsville coke region recently broke its records of coke shipment for the current year in spite of the pronounced shortage of cars. The total weekly shipments aggregated approximately 458,000 tons, while the production was estimated at 445,000 tons. The largest previous shipment of the year was 442,000 tons.

California—What is believed to be the largest tonnage in the history of the 21st Bituminous District was produced in 1915, according to the report of Inspector Charles P. Byrne. The total production of coal for the year was 7,026,276 net tons, while 6,297 workmen were employed. The Vesta Coal Co. led in coal production, the big No. 4 mine located at California, producing an average of 6,265 tons for each day throughout the year. This is believed to be practically the largest tonnage of any coal mine in the world. One hundred miles of track underground are required, and 35 locomotives haul the coal to the sidetracks. This mine gives employment to 1,350 men.

Brownsville—In a deal recently said to have been closed, Mrs. Quinn D. Hibbs sold coal under 113 acres of land in Luzerne Township of Fayette County, to the H. C. Frick Coke Co., for a consideration of approximately $100,000. The Frick company will work the tract from the Bridgeport mines, the working adjoining the tract on the north.

MARYLAND

Cumberland—It is reported after careful investigation that the explosion at the Kempton mine of the Davis Coal and Coke Co., in which 15 miners lost their lives, was caused by a blownout shot in Room No. 11 on the first left off the first dip. A notice to this effect was recently posted at the office of the company.

WEST VIRGINIA

Gary—The coal and coke production at the plants of the United States Coal and Coke Co. is rapidly increasing. Several hundred coke ovens which have been idle for many years are now being fired up, over 1,700 now being in blast, while it is said that within a short time 2,500 will be in operation. Thus far coke shipments have been light since much of the coke produced has been used in firing up additional ovens. It is believed, however, that during March, 90,000 tons of coke will be shipped from this firm's plants.

Clarksburg—The Central Fairmont Coal Co. recently installed a new gas engine at its Snake Hill mine. This machine will supply power for hauling and will greatly facilitate operations.

War Eagle—The Traders Coal Co. has acquired the properties of the Margaret Mining Co. and is installing a power plant and extending the incline. It will increase the output by from 400 to 600 tons per day.

Beckley—A corps of engineers has been going over some of the coal leases on the new Stone Coal Branch of the Virginian Ry. and further developments of mining in this field are expected. The branch will be ready for operation in a few weeks.

Williamson—The mines in the Thacker field are putting in good time and a better price is being realized for the output. The mines in the Pocahontas district are running full time, although labor is scarce.

ALABAMA

Birmingham—The announcement that the Alabama Power Co. is to spend $100,000,000 in this district within the next 10 yr., $10,000,000 of which will be spent within the next three years, is causing some little concern among the coal operators in this district, as a large proportion of this will be spent on developing further water power on the Coosa River at Lock 12, and the erection of another unit on the Warrior River west of Birmingham, about 20 mi. The operators have already lost considerable business throughout this district due to industrial plants changing over to electricity instead of coal, and the announcement that 17,500 additional horsepower will be generated within the next year or two does not sound good to them.

Quinton—One of the stockades of the Pratt Consolidated Coal Co. near Quinton was burned a few days ago. The loss is about $5,000. There were 160 convicts in the stockade at the time. All escaped injury.

KENTUCKY

Harlan—A double daily train service to Louisville has been granted by the Louisville & Nashville Railroad Co. It has been sought for some time by Louisville business men and others interested in the coal fields in this section.

Hazard—The Kentucky Mining Institute has been given an invitation by the Hazard Commercial Club to hold its annual meeting the middle of May in this city. The Institute met last year at Pineville.

Paintsville—With every coal mine along the Big Sandy River busy, more coal is being mined in this section than

ever before. Mines at Wayland and Steel Creek belonging to the Elkhorn Coal Corporation, are operating full for the first time since they were opened three years ago. The new Chesapeake & Ohio, and Carolina, Clinchfield & Ohio connection, giving a direct route to the Atlantic Coast, is responsible for this activity. This route has been opened for two months. Operations are being hampered by a shortage of men.

OHIO

Cannelville—The Turkey Run Coal Co. has made a contract with the Southeastern Railroad, Light and Power Co. whereby the latter is to furnish electric current for operating purposes, and is now running the transmission line a distance of 3½ mi. to the mines. The work is to be completed by Apr. 1. Sufficient current will be furnished to supply a number of mines in the vicinity.

Glouster—It is reported that the Continental Coal Co. has made arrangements to take over a part of the holdings of the Sunday Creek Coal Co. in this section, including Mine No. 256 at this point. Some machinery has been removed from this mine for shipment to other points, but it is understood that the completion of the deal referred to will mean the resumption of operations.

W. P. Rick, owner of the Palos mine, is reported to be contemplating closing his plant, on account of continuous trouble with employees. He is quoted as stating that operations for the first two months of the year were at a loss of $3,000, and that if conditions do not improve during the current month he will dismantle the mine and suspend operations indefinitely.

INDIANA

Brazil—The Lost Creek mine of the Vandalia Coal Co., at Seelyville, the largest mine in this vicinity, was idle for two days recently because of its inability to get cars delivered to the mine.

Boonville—Workers employed at the Big Four mine near here have resumed operations. Trouble with miners in the Hartville district resulted in a closing down of the Big Four mine for several days. The Hartwell miners are alleged to have made threats when Big Four workers refused to quit when some of their coworkers were let out.

ILLINOIS

Carlinville—Alexander W. Crawford, of Hillsboro, Ill., is taking options on coal lands north and south of Carlinville, with prospects of a sale to a large corporation. He intends to secure options on 25,000 acres. He recently put through a deal in this community in which $600,000 worth of coal holdings changed hands. Crawford's son, A. M. Crawford, is associated with him in the work of promotion.

Nokomis—The two Nokomis mines broke their best previous record one day last week by hoisting 8,101 tons of coal. The output of the North mine was 4,873 tons, an increase of 135 tons over its previous record, made three months ago. The actual time spent in hoisting was less than 7 hr. The day's output filled 1454 pit cars and was carried from the mine in 110 railroad cars. This mine is going after the state record, now held by the Superior Coal Co.'s mine at Gillespie, with 300 tons in excess of the Nokomis record to its credit for a day's output. The West mine is new and has not reached the limit of its production and it too is expected to be a contender for the state record. The payroll of the two mines is now about $100,000 a month.

PERSONALS

J. D. Jones, lately superintendent of mines for the Columbus Iron and Steel Co., at Martinsburg, has resigned.

Brooks Fleming, Jr., was recently made assistant general manager of the operations of the Consolidation Coal Co.

Michael McAndrews, of the engineering department of the Consolidation Coal Co., has accepted an engineering position with the Watson Coal Co.

Edward H. Coxe, consulting mining engineer, of Knoxville, Tenn., spent the past week in Cincinnati and Columbus, Ohio, and Pittsburgh, Penn., on business.

Joseph D. Lumaghi, secretary of the Lumaghi Coal Co., St. Louis, Mo., was a member of the Reception Committee for the National Defense Conference of Mayors, held in St. Louis recently.

Joseph Virgin, for the past several months conducting the Virgin store in Moundsville, W. Va., has been appointed superintendent of the Mound City coal mine. Mr. Virgin formerly held this same position.

Hanson Waddell, who has been residing at Woodlawn, W. Va., left recently for Sheridan, Wyo., to establish himself in the business of coal mining with his son, Edward Waddell, who is a prominent Wyoming coal operator.

Major Inglis, new general manager of the Coal Department of the Delaware, Lackawanna & Western, was recently tendered a banquet at the Casey Hotel in Scranton by the president and directors of the Pennsylvania Coal Co. and the Hillside Coal and Iron Co.

Thomas Cook, a retired coal operator, who has been in a critical condition at a hospital in Belleville, Ill., for several weeks, from injuries received in an explosion of carbide gas at his home, is now out of danger. His wife died from injuries she received at the same time. It is only within the past few days that he was informed of her death. He is 75 years old.

OBITUARY

Capt. David H. Harts, a pioneer coal-mine operator of Illinois, died recently at his home in Lincoln, at the age of 77 years.

Maj. Manning M. Kimmel, formerly an engineer in the employ of the St. Bernard Coal Co., at St. Charles, Ky., died recently at his home in Henderson, Ky. He was 83 years of age and a veteran of the Civil War, having served in the Confederate Army.

Charles Milton Espey, 65 years old, a native of St. Louis, but in recent years a resident of New Orleans, and member of the board of managers of the Monongahela River Consolidated Coal and Coke Co., died in New Orleans on Mar. 3, after an illness of several months. He is survived by a daughter, Mrs. Lyman B. Reed, New Orleans, and a sister, Mrs. Roger D. Davis, of San Antonio, Tex.

E. Howard Smith, general manager of the Superior Supply Co., Bluefield, W. Va., died recently, aged 52 years. He was born in Richmond, Va., and was first employed by the Smith-Courtney Co. of that city, and afterward was connected with the Miller Supply Co., of Huntington, W. Va., with which concern he remained until he became general manager of the Superior Supply Co. in 1904. This position he held until the time of his death, and in addition has been president of the Sterling Hardware Co., Bluefield, W. Va., for the past three years.

James Asa Childs, aged about 51 years, superintendent of the Bitner and Juniata plants of the H. C. Frick Coke Co., and brother-in-law of Henry Clay Frick, died on Mar. 1, in the Memorial Hospital, New York, of pneumonia, which developed on Feb. 25, following two operations for appendicitis. Mr. Childs had been ill since the holidays. He went to New York several weeks ago for treatment. He underwent an operation for the tonsils, and two days after his return from the hospital appendicitis developed. Peritonitis set in, and later pneumonia. Mr. Childs was a native of Pittsburgh. He was a practical coke man, and was superintendent at Adelaide from 1895 to 1906. He married Mary Belle Hogg, daughter of the late Mr. and Mrs. John T. Hogg, of Pittsburgh. No children were born to them. The family lived on a farm in Dunbar Township, known as "Pleasant Level." The funeral was held on Mar. 3.

RECENT COAL AND COKE PATENTS

Impulse Coal Washing Machine. R. Hamilton, Birmingham, Ala. 1,169,806, Feb. 1, 1916. Filed June 11, 1915. Serial No. 33,448.

Gas Producer. J. E. Bell, New York, N. Y. 1,170,496, Feb. 1, 1916. Filed Mar. 6, 1912. Serial No. 681,880.

Mining Machine. N. D. Levin, assignor to Jeffrey Mfg. Co., Columbus, Ohio. 1,169,842, Feb. 1, 1916. Filed Mar. 17, 1914. Serial No. 825,370.

Boiler for Producing Superheated Steam. H. B. Spear, Seattle, Wash. 1,170,013, Feb. 1, 1916. Filed June 5, 1914. Serial No. 843,288.

Coal Car Wheel and Axle. J. Schanman, Pittsburgh, Penn. 1,170,682, Feb. 8, 1916. Filed June 30, 1914. Serial No. 848,166.

Draft Regulator for Furnaces. G. H. Scharf, assignor to Scharf Smoke Preventer Co., Ypsilanti, Mich. 1,170,683, Feb. 8, 1916. Filed Dec. 30, 1911. Serial No. 668,596.

Mine Shaft Roller. J. Gremmell, Calumet, Mich. 1,171,039, Feb. 8, 1916. Filed Nov. 13, 1914. Serial No. 871,872.

Tuyer Structure for Gas Producers. L. Steelman, Millville, N. J. 1,172,070, Feb. 15, 1916. Filed Sept. 26, 1914. Serial No. 863,610.

Heat Conserver and Smoke Consumer. W. E. Frost, Auburn, Me. 1,172,130, Feb. 15, 1916. Filed July 15, 1915. Serial No. 40,010.

Self-Cleaning Stoker. W. J Kenney and H. P. Grohn, assignors to Under Feed Co., Chicago, Ill. 1,172,292, Feb. 22, 1916. Filed Dec. 20, 1913. Serial No. 807,828.

Process for Carbonizing Coal. H. L. Doherty, New York, N. Y. 1,172,682, Feb. 22, 1916. Filed Dec. 27, 1909. Serial No. 535,036.

Flue Scraper. E. Kopke, Honolulu, Hawaii. 1,172,308, Feb. 22, 1916. Filed Feb. 12, 1913. Serial No. 747,947.

Stoker. E. Young, Pony Lake, Neb. 1,172,657 Feb. 22, 1916. Filed Apr. 12, 1915. Serial No. 20,837.

Furnace. W. J. Kenney, assignor to Under Feed Co., Chicago, Ill. 1,172,290, Feb. 22, 1916. Filed June 13, 1910. Serial No. 56,653.

Briquet and Method of Producing the Same. L. J. Curtman, New York, N. Y. 1,173,779, Feb. 29, 1916. Filed May 20, 1913. Serial No. 768,697.

Coupling for Mining Cars. E. S. Earls, Danville, Ill. 1,173,494, Feb. 29, 1916. Filed Apr. 24, 1914. Serial No. 834,107.

Grate for Gas Producers. J. Winger, Liege, Belgium. 1,173,693, Feb. 29, 1916. Filed Jan. 31, 1913. Serial No. 745,498.

Mine Car Wheel and Bearing. J. J. Roby, Cleveland, Ohio. 1,173,218. Feb. 29, 1916. Filed Mar. 9, 1914. Serial No. 823,285.

Mining Machine. F. Cartlidge, Terre Haute, Ind. 1,173,170, Feb. 29, 1916. Filed Oct. 21, 1913. Serial No. 796,410.

Method for Burning Fuel. H. M. Chance, Philadelphia, Penn. 1,173,708, Feb. 29, 1916. Filed Sept. 23, 1915. Serial No. 52,193.

Mining Car Wheel. A. B. Day, Knoxville, Ky. 1,173,179, Feb. 29, 1916. Filed Nov. 18, 1915. Serial No. 62,178.

INDUSTRIAL NEWS

Pittsburgh, Penn.—The Standard Scale and Supply Co. recently moved its offices from Water St. to 1631 Liberty Ave., Pittsburgh.

Vincennes, Ind.—William P. McQuade, superintendent of the Indian Creek coal mine, was recently fined $300 in the Circuit Court for failure to provide free washhouses for the miners.

Huntington, W. Va.—Coal loading for the month of February of the present year on the Chesapeake & Ohio R.R. amounted to 2,296,810 tons. This is 762,177 tons over the same month of 1915.

New York, N. Y.—The Associated Geological Engineers recently announced the opening of a New York office at 311 Equitable Building, 120 Broadway. Offices are also maintained in Boston, Washington and Pittsburgh.

Grafton, W. Va.—It is stated that the Baltimore & Ohio R.R. Co. is negotiating for the purchase of the Coal and Coke R.R. It is regarded as probable that a direct line will be established between Pittsburgh and Charleston by way of Grafton.

St. Louis, Mo.—The General Roofing Co., East St. Louis, Ill., has awarded to the Kolb Coal Co. the contract for furnishing 4,000 tons of screenings for storage during April and May. The screenings are to be stored at Mascoutah, Ill., and the purchaser is to pay for reloading.

Gadsden, Ala.—The Gulf States Steel Co. has awarded a contract to H. Koppers Co., of Pittsburgh, Penn., for the construction of 10 byproduct coke ovens at Gadsden, Ala. Twenty-four acres of ground have been purchased for the site. The investment will amount to $900,000.

Washington, D. C.—Tariffs of the Bessemer & Lake Erie Railroad Co., increasing carload rates on coal by 10c. per net ton from mines on its lines in Pennsylvania to points in eastern New York and New England, were suspended on Mar. 3, until July 4 by the Interstate Commerce Commission.

Steubenville, Ohio—An explosion caused by a naked-flame mine lamp, igniting a tank of oil, is the basis of a suit by Mrs. Susan Montgomery, who asks $25,000 damages for the death of her husband in December. The suit is against George Culp, mine owner, and charges negligence in connection with the handling of the oil.

Lancaster, Ohio—The Columbus & Southern R.R., which extends a distance of 22 mi. from Wyandotte, Fairfield County, to South Bloomingville, Hocking County, was sold recently at receiver's sale at the court house, Lancaster, for $43,000, to Eastern capitalists. The road never paid expenses. It taps a fairly rich coal field.

Wheeling, W. Va.—It is stated that a large corporation in which local financiers are interested, has succeeded in taking up several thousand acres of coal lands in eastern Ohio between Lisbon and Marietta, and that a right-of-way for a coal-carrying railroad will be secured. The deal is reported to involve nearly $2,000,000.

Harrisburg, Penn.—Under the new ruling made by the Attorney General on Mar. 4, candidates for mine inspector in the anthracite region must file nominating petitions with the Secretary of the Commonwealth, and not with the County Commissioners, of the various counties, it having been decided by the Supreme Court that they are state officers and not county officers. Twenty-five are to be elected this year.

Washington, D. C.—The Interstate Commerce Commission recently issued another supplemental order in the Indiana and Illinois coal rates case, vacating in part its order of Jan. 6, which suspended until Apr. 13 the proposed increase of 5c. per net ton on coal from Indiana and Illinois mines. This supplemental order permits the new rates to go into effect as to certain mines in groups 1 and 2 on the St. Louis division of the Southern Ry.

Edwardsville, Ill.—Perhaps the first injunction against the Wabash Railway Co. reorganized from the Wabash Railroad Co., which passed through a long receivership, was obtained in the Circuit Court at Edwardsville recently, by the Home Trade Coal Co. The petition was filed when a rumor became current that the railroad was arranging to tear up the tracks leading to the mine. The order issued by Judge J. F. Gillham restrains the railroad from disconnecting its track from the switches and commands it to supply the necessary coal cars.

New York, N. Y.—A resolution has been introduced in the Board of Aldermen of New York City, authorizing the president of that body to appoint a committee to investigate the means and ways of purchasing coal for the city and to recommend a more economical and feasible plan than that now in operation. The resolution which was introduced by Alderman Palitz says that the price of coal had constantly increased in the city and that the City of New York is at present purchasing coal from "different so-called coal dealers, instead of directly from the operators."

Washington, D. C.—The Interstate Commerce Commission has handed down another order bearing on the rates on anthracite coal via the Delaware, Lackawanna & Western, Lehigh Valley, Erie, Central R.R. of N. J., and the Delaware & Hudson railroads on shipments consigned to northern New Jersey and central New York points. The original order of the commission in July, 1915, made a drastic reduction in the rates, but on appeal of the railroads this was modified last November by allowing a small advance, and in this the latest instance the change in the rates allows of an advance on all sizes varying from 5c. to 25c. per ton as compared with the schedule in the original order. The effective date for the new rates is now set for Apr. 1.

St. Louis, Mo.—The February report of William McC. Martin, federal reserve agent for the St. Louis District, indicates that business is flourishing in all the states and districts included in the territory of the St. Louis Federal Reserve Bank. The district embraces all but the extreme western portion of Missouri, southern Illinois, Kentucky, Tennessee, Arkansas and portions of Indiana and Mississippi. Reports from various interests are that prosperity is greater than for several years. There were fewer commercial failures in January than in January, 1915, or the same month of 1914. There was a gain of over $111,000,000 in the bank clearings of St. Louis, Louisville, Little Rock, Evansville and Memphis. The clearings in January were over $577,000,000. Bank reserves are higher than usual at this time of the year.

New York, N. Y.—J. H. Torney, who was assistant manager of the Southern Pacific Co.'s Atlantic steamship lines, has been appointed to the management of R. Martens & Co., of No. 24 State St., New York City. D. A. Thomas, the Welsh coal operator, is the president of this firm, and Richard C. Martens is vice-president and managing director. The company recently leased from New York City the new city pier located at Canal St., Stapleton, for which it will pay a rental of $42,000 a year. The lease runs for 10 yr. with a renewal clause for 10 yr. more. R. Martens & Co. is one of the largest export and shipping firms in the world. It is its intention to establish a line of steamers between New York and Black Sea ports as soon as peace is declared. At present a service is being planned between New York and Archangel.

Market Department

General Review

Approaching end of the season creates a reactionary tendency in anthracite. Bituminous also quiet with the approach of an agreement at the wage conferences. Large movement on contracts at interior points but spot market is dull. Contract prices in Middle West higher and current market also stiffer due to colder weather.

Anthracite—The demand has been well maintained, as a result of the severe weather, but with the end of the season now rapidly approaching, a definite reactionary tendency has set in, which has been further aggravated by the numerous uncertainties concerning the future of the hard-coal trade. Interest at the present time centers on the question as to whether the customary April discount on the domestic grades will be made by the large companies. The situation hinges largely on the result of the labor conferences, and in event of no agreement being effected, the winter schedule will doubtless be continued. Embargoes in certain directions, notably to down East points, has diverted abnormal tonnages to other centers and forced prices down.

Bituminous—The near arrangement of the bituminous wage scale resulted in a moderate collapse of the soft-coal market, though this had been discounted to a certain extent. Orders for storage coal have been a potent factor in the recent strong market, and the sweeping cancellations coming in on the announcement that an agreement had been effected at New York created a sharp reaction, although the market stood up under the adverse news in better form than was anticipated. Interest is concentrated on negotiations on the new contracts though there is still a wide difference between buyers and sellers, the latter holding out firmly for a substantial increase on last year's figures; with a considerable volume already covered at relatively low figures, it is doubtful if they will be able to realize their expectations. On coastwise contracts the abnormal conditions prevailing in the freight market have complicated negotiations on this business appreciably.

Exports—The movement foreign has again declined, due mostly to the adverse weather conditions that have retarded loading at the piers, though the constantly increasing freight rates are also doubtless a factor. The movement at Hampton Roads for last month showed a heavy increase over the same month for the preceding year, though it was somewhat under the January figures as was expected.

Ohio Valley—The spot market is dull and very irregular, and subject almost entirely to the constantly changing conditions in transportation circles. It has developed that many consumers bought heavily at the time of the recent shortage, and some have supplies sufficient for several months. Consumption still continues heavy, but the over-supply at most points has forced prices back to about normal, though fluctuations are frequently sudden and extend over a wide range. With the close of the winter season now at hand, consumers are obviously buying sparingly to avoid carrying over any surpluses. Most of the interest is centered on slack coal, which is generally in good demand in all directions. It is understood that large contracts have been concluded for transporting coal to the upper Lake ports at a moderate advance over last year's figures.

Middle West—Colder weather and snow have stiffened up the market notably, particularly on screenings which continue scarce at top prices. The mines are generally working up to the full limit of the car supply, though well informed observers are beginning to anticipate a heavy curtailment in operation Apr. 1 until the surplus accumulation is cleaned up. On contracts for the new year, some moderate increases are noted, with the figures arranged subject to further increases, should the miners obtain an advance in wages. Storage operations have practically ceased with the growing conviction that a wage agreement will be effected in the bituminous regions without serious difficulty. Shipments out from the upper Lake ports continue exceedingly heavy, and it is evident that a large tonnage of Eastern coal will be required there this summer.

Year Ago—Anthracite shipments show a heavy decline. Outlook for April business rather unfavorable. Bituminous buyers forcing concessions on new contracts. Negotiations progressing slowly. Pessimistic outlook for the Lake trade.

Business Opinions

Boston News Bureau—While the general situation remains mixed and, therefore, uncertain, there is a more confident feeling prevailing. There is a steady advance in the prices of raw materials, but this is offset largely by the increased demand of the consumers, the larger borrowing capacity, the further increase of corporate profits and the growing financial strength. There seems to be an increasing belief that the present period is a crucial one in the European war, and that much will depend upon the issue of the pending military operations before Verdun. It is difficult to imagine a situation that is so dependent upon actual developments. Conditions at home as well as abroad require the most careful consideration. Every day is likely to see new phases, so that no man really knows where he is at. There is no question as to the fundamentals. Our country is growing in money power in a greater degree than we can appreciate. Some day we must come into our own.

Iron Age—Shipments from mills were very heavy in February and some of the latter, notably those of the largest Chicago district producer, broke all records. In the Pittsburgh district the mills are working as never before to reduce piled-up orders, and some are succeeding. Generally, however, and partly due to embargoes, the month left producers farther behind in deliveries. Reports of embargoes and car shortages show that the railroads are getting deeper in the mire and that situation, with the added threat of strikes, is giving shippers no little concern. While some consumers continue to bombard mills with business on which price is quite unimportant compared with deliveries, others enlarge on the dangers of recent rapid advances and are moving with caution. But what seemed famine prices a few months ago are readily paid today and the expectation of higher levels is general among all.

Dun—All speculative markets have undergone reaction, but commercial enterprise moves steadily forward, adding to the notable gains previously recorded. Influences that affect stocks, grain and cotton fail to alter the even course of money and exchange, nor is the solid foundation of business confidence shaken. Rapidly rising prices of materials and products, however, cause increasing uncertainty, though in most cases stimulating rather than curtailing consumption. Many buyers, anticipating continued advances, are prompted to provide for future requirements at current levels, yet experience greater difficulty in further extending commitments. Commercial failures this week in the United States are 380 against 407 last week, 428 the preceding week and 478 the corresponding week last year.

Bradstreet—Undiminished activity, further advances in prices, widespread car shortages, scarcity of many raw materials, some lines withdrawing salesmen from the road because of oversold conditions, capacity operations in leading industries, good collections, launching of new enterprises on a noteworthy scale, and few doubts as to the future, are the preëminent features disclosed in this week's reports. Though buyers continue to deplore the everrising tendency of prices, they see before them a situation in which demand continues to outstrip production, with prospects, perhaps, of greater shortages later on. Consequently, the policy is to buy now regardless of prices, though of course there is more or less concern over the question of profits. However, the main point is that the recent wave of all-around buying, the force of which is still unspent, has carried movements to levels never before witnessed in this country.

American Wool and Cotton Reporter—Manufacturers bought considerably for the week under review although the actual volume of sales was not so large as for some of the previous weeks, owing to the fact that a holiday occurred. The western wool growers are commanding the high prices which some dealers are willing to pay, but contracting is not so active in some quarters because of the prices asked.

Marshall Field & Co.—Current wholesale distribution of dry goods is running well ahead of the corresponding period of a year ago. Road sales for immediate delivery are normal, but well ahead for later spring and very heavy for fall delivery. Customers have been in the market in about equal numbers. Collections are normal. Prices are firm.

ATLANTIC SEABOARD

BOSTON

Pocahontas and New River contract demand fairly strong, with the $2.85 price reasonably well maintained. Georges Creek scarce and Pennsylvania operators canvassing for contract business. Anthracite market continues active.

Bituminous—The movement of Pocahontas and New River is as good as weather conditions permit and were it better receipts here would be large on account of the strong contract demand at all points. That is likely to be characteristic of the Hampton Roads trade during March, particularly on f.o.b. sales, so long as coal at the piers is in ample supply. There is more fear now of a slackened demand than of any shortage of the West Virginia steam grades. A few of the smaller agencies are pressed to relieve cars and concessions down to $2.75 have been made.

The shippers who have coal to sell next year are still unable to name any delivered price basis that is at all attractive to the few large consumers who did not cover their requirements last fall. F.o.b. it is not felt that anything in excess of $2.85 can be realized.

A fair spot market continues at Boston and Providence for points inland that ordinarily rely on shipments all-rail. The embargo against the Boston & Maine R.R. was lifted only a week ago and prices up to $5.75 on cars at Tidewater distributing points were the rule while the embargo was effective. Stocks are light rather than heavy, and it looks as if there would be a steady demand for small lots through New England for at least a month or two. As high as $7 on cars has been realized for small shipments inland from Portland.

Shipments of Georges Creek are few and far between. Only scattering cargoes have been loaded even at Baltimore, and the quantities available at Philadelphia and at New York have been almost negligible. The deficiency is still being made up in part by loading Georges Creek transportation at Hampton Roads. Nothing is heard with regard to prices either f.o.b. or alongside on this grade for the coming contract year.

On the Pennsylvania grades there is also a dearth of news on contract prices. Some of the operators are trying to sell coal subject to a mining clause which may or may not amount to 8@10c. per ton. There seems to be a good deal of confidence on the part of bituminous interests in Pennsylvania that the market will stand at least 25@30c. more than a year ago. This view, however, is not shared by buyers in this territory and on that account the spring market is likely to open very slowly. The Hampton Roads coals set the pace in this territory and with so large a volume already sold at low prices it is hard to see how a much higher basis can be returned for the grades from Pennsylvania.

Anthracite—Continuous storms with snow and low temperatures have kept Tidewater New England on the anxious seat the past fortnight. All-rail embargoes have further complicated the situation. Stove and broken are in shortest supply and so insistent is the demand about New York that these sizes are next to impossible to secure except in dribbling quantities.

Bituminous prices, f.o.b. loading ports at points designated, are about as follows, per gross ton:

	Philadelphia	New York	Baltimore	F.o.b. Mine
Clearfields	$2.70@3.25	$3.00@3.60	.....	$1.35@1.75
Cambrias and Somersets	3.00@3.50	3.30@3.85	.....	1.70@2.10
Georges Creek	3.75@3.85	4.00@4.15	.....	.....

Pocahontas and New River are quoted at $2.80@2.85 f.o.b. Norfolk and Newport News, Va. On cars at Boston and Providence, Pocahontas and New River are quoted at $5.25 to 5.75.

NEW YORK

Anthracite market uncertain. Supplies plentiful owing to New England embargoes. Prepared sizes easy but steam coals tight with prices firm. Bituminous strong and prices slightly better. Shipping delayed by frozen coal. Contract prices higher than last year.

Anthracite—The hard coal situation at Tidewater continues uncertain. Much more coal is arriving than is really necessary to meet the demand, owing to sections of New England and eastern New York remaining under embargo. On this account prepared sizes are easy and on some grades slight concessions have been quoted. Demand is not heavy most dealers holding off. Nothing has been heard from the operators regarding the usual spring reduction of fifty cents per ton on prepared sizes and no word is expected until after the negotiations between the operators and miners as to the new working agreement is completed.

Salesmen report active business inland, especially to towns along the Sound. Strong efforts are being made to relieve the Tidewater situation by sending considerable coal to New England dealers with water connections, but some delay has been occasioned because of frozen coal. Over-supply at the docks has resulted in concessions of from 5 to 10c. per ton on egg, stove and nut coals. While there is little call for pea coal at Tidewater there is a good market for it along the line.

The steam coal situation is good. No. 1 buckwheat is tight with quotations running from $2.85 to $3.25 f.o.b. No. 2 buckwheat is short in good grades and quotations were as high as $2.30 f.o.b., with No. 3 buckwheat ranging from $1.90 to $2 f.o.b.

Current quotations, gross tons f.o.b. tidewater are as follows:

Lower Ports	Circular	Individual
Broken	$5.05	.....
Egg	5.30	$5.30@5.30
Stove	5.30	5.30@5.30
Nut	5.55	5.55@5.55
Pea	3.50	3.50@3.75
Buck	2.75	2.85@3.25
Rice	2.25	2.10@2.30
Barley	1.75	1.90@2.00

Quotations at upper ports are five cents higher owing to the differences in boat rates.

Bituminous—The bituminous coal market at Tidewater is strong. Demand is good but deliveries are slow owing to frozen coal. Prices are firm, advances of from 10 to 25c. having been made on some grades. Some shippers with contracts are having difficulty in keeping customers supplied. Embargo conditions remain practically unchanged. There is considerable congestion of boats at several of the docks. Harbor rates advanced to 30c. the first of the week owing to the storm.

Some new contracts have been closed at advances over last year's prices but most shippers and large consumers are awaiting the outcome of the wage conferences. Car supply interferes greatly with production and on this account it is predicted that March business will keep active.

Current quotations, gross tons, f.o.b., Tidewater, are on the following basis:

	South Amboy	Port Reading	St. George	Mine Price
Georges Creek Big Vein	$4.25@4.50	$4.25@4.50	$4.25@4.50	$2.75@3.00
Georges Creek Tyson	3.50@3.75	3.50@3.75	3.50@3.75	1.95@2.20
Clearfield: Medium	3.25@3.50	3.25@3.50	.....	1.70@1.95
South Forks	3.50@3.75	.....	.....	1.95@2.20
Nanty Glo	3.35@3.60	.....	.....	1.80@2.05
Somerset County: Medium	3.25@3.50	3.25@3.50	3.25@3.50	1.70@1.95
Quemahoning	.....	3.45@3.60	3.45@3.60	1.90@2.05
West Virginia Fairmont ¾	.....	3.25@3.40	3.25@3.40	1.45@1.60
Fairmont mine run	.....	3.25@3.40	3.25@3.40	1.45@1.60
Western Maryland	.....	3.00@3.50	3.00@3.50	1.45@1.95

PHILADELPHIA

Anthracite trade for the season disappointing. Dealers anxious about new conditions. All sizes in strong demand, but inadequate car supply delays shipments. Individuals make first price cuts. Bituminous shipments embargoed, prices decline and orders scarce.

Anthracite—With the end of the season now at hand, a retrospective review discloses an unsatisfactory business for the period. It is true that the big companies moved large tonnages during December, January, and February, but it is also a fact that their shipments of storage coal, particularly chestnut size, fell substantially below expectations. The season has been especially unsatisfactory to the smaller shippers and individuals, who are now actually canvassing for business. It has even developed that there is considerable coal standing on demurrage, on which confidential offers of 10c. to 15c. off the circular for prepared grades are being made.

Current business with the large companies continues satisfactory, due to the inclement weather, but there are so many rumors of impending changes and uncertainties that dealers will be cautious about taking the usual spring stocks. Dealers are in a strong position as regards supplies, and are feeling out the big interests on the matter of prices, Apr. 1. There is a general feeling that it will not be advisable to make the customary reduction of 50c. per ton on the prepared sizes, and if indications point to a suspension of any appreciable proportions, there are little prospects of the reduction being put in effect.

Broken coal remains in the same active demand and no new business is sought. The contract rate of $3.35 is now considered a bargain and no coal of this size goes begging at full circular of $3.60. Egg at $3.85 is also well sold; the supply of many domestic users is exhausted and it has taken a considerable tonnage to refill their bins. Stove at $4.10 is

as usual moving without difficulty and the demand is satisfactory, as it has been all season. Chestnut at $4.25 is in fair demand but little or none of the immense storage stocks are being drawn on.

Pea coal at $2.55 is the real leader, of the domestic grades, and unless a wonderful improvement is shown in the car supply, many orders now on the shippers' books will still be unfilled on Apr. 1. Enough of this size is known to be in several of the big companies' storage yards to flood the market, but it is doubtful if any great part of it can be moved this month. Buckwheat and rice coal continue in good demand.

Prices per gross ton, f.o.b. cars at mines for line shipments and f.o.b. Port Richmond for tide shipment are as follows:

	Line	Tide		Line	Tide
Broken	$3.60	$4.85	Pea	$2.55	$3.30
Egg	3.85	5.10	Buckwheat	1.55	2.30
Stove	4.10	5.10	Rice	.90	1.80
Chestnut	4.25	5.35	Barley	.55	1.30

Bituminous—Despite the fact that the railroads are completely embargoed against this territory, prices continue to weaken. The biggest drop was in the high-grade coals, Georges Creek going to $2.25@2.50. The decreases in the other grades ranged from 5c. to 25c. a ton. Optimistic reports from the New York wage conference have restricted ordering, although in the present condition this makes no particular difference, as the mines are working on short time on account of the lack of cars only filling from 25% to 40% of the orders in hand. A good deal of the falling off in new orders is due also to the railroads pressing the manufacturers to release coal cars and have actually prevailed on them not to have further shipments made until coal in transit has been taken care of. The railroads are in a serious condition, but the mining interests resent the intimation that the congestion is largely due to speculation on the part of those holding cars. In the face of a falling market for a month past such an explanation almost borders on the ridiculous. Slack is probably in the greatest demand this week; it has been scarce, due to the fact that many of the large cement plants are calling for it in preparation for resuming full time at their plants with the approach of spring.

Prices per gross f.o.b. cars at the mines are about as follows:

Georges Creek Big Vein	$2.25@2.50	Fairmont gas, ¾	$1.65@1.75
South Fork Miller Vein	1.85@1.95	Fairmont gas, mine-run	1.40@1.50
Clearfield (ordinary)	1.60@1.70	Fairmont gas, slack	1.35@1.45
Somerset (ordinary)	1.50@1.60	Fairmont lump, ordinary	1.40@1.50
West Va. Freeport	1.40@1.50	Fairmont mine-run	1.25@1.35
		Fairmont slack	1.30@1.40

BALTIMORE

Exports again decline. Cold weather causes late activity in hard coal. Embargoes continue and bituminous situation is flat.

Only two export cargoes cleared this week with a total of 5,016 tons. Much activity exists in household demand for anthracite. Cold weather continuing into March has caused a late demand in one- and two-ton lots especially.

The soft coal situation is flat. Embargoes to the north are confining deliveries largely to B. & O. line points, and spot coal is offering at from twenty to thirty cents off the figures asked on contracts for the new year. Very little contracting is being done, as operators are holding firm for prices above the figures of last year and because of the prevailing dullness consumers are showing little interest.

Prices at the mines rule about as follows: Georges Creek Tyson, $1.80 to $1.90; Clearfield, $1.60; South Fork, $1.60; Latrobe, $1.30; Somerset, $1.50 to $1.60; Freeport, $1.10 to 1.20; Fairmont, three-quarter, $1; mine-run, 95c.; slack, $1.15.

HAMPTON ROADS

Heavy movement continues with prices unchanged but steady.

The dumpings have been heavy but were somewhat less than anticipated owing to the fact that weather conditions have retarded the work of unloading cars. Prices are practically the same while there is a good demand and a fair accumulation of coal at tidewater.

Shipments for the month of February amounted to 1,278,037 tons which is an increase by nearly one-third over the figures for the same month of 1915. Of the total dumpings the Norfolk & Western moved 584,699 tons, the Chesapeake & Ohio 364,798 and the Virginian Ry. 328,540 tons. The total number of tons dumped during the month is somewhat below the January figures which was expected.

Railroad Tonnages—Dumpings over the local piers for the past five weeks compare as follows:

	Week Ending				
Railroad	Feb. 5	Feb. 12	Feb. 19	Feb. 26	Mar. 4
Norfolk & Western	128,288	158,265	121,156	156,521	119,920
Chesapeake & Ohio	106,543	106 525	71,513	87,450	84,849
Virginian	75,840	63,056	92,243	78,463	.....
Totals	310,671	327.846	284,912	322,434	.....

Ocean Charters and Freights

OCEAN FREIGHTS

We chartered a number of steamers during the past week to load coals for Lower Plate ports, at or about $21.60 with 500 tons per day discharge, but others closed a steamer at the same time for the same voyage at $22.80, which has advanced owner's ideas, and some are now holding for $24. A number of very large steamers were also closed for coals to Rio, at or about $17 net, all freight in advance without discount, with 1,000 tons per day discharge, and we have had other tonnage proposed on these terms. We also closed a number of steamers for West Indian coal, which rates continue to advance. Rates to the Mediterranean are slightly higher.

We would quote freight rates on coal by steamer as follows:

To	Rate	To	Rate
Havana	$4.25@4.50	Bermuda	$4.50@5.00
Cardenas or Sagua	5.50	Vera Cruz	6.50@7.50
Cienfuegos	4.50@5.00	Tampico	6.50@7.50
Port au Spain, Trinidad	7.50@8.00	Rio	17.00@17.50[4]
St. Lucia	7.50@8.00	Santos*	17.00@17.50*[4]
St. Thomas	7.00@7.50	Montevideo	22.80@24.00[1]
Barbados	7.50@8.00	BuenosAires or La Plata	22.80@24.00†
Kingston	4.50@5.00	Rosario	24.00@26.40[2]
Curacao	7.00[3]	West Coast of Italy	27.60@28.80
Santiago	4.50@5.50	Barcelona[5]	25.20@26.40**
Guantanamo	4.50@5.50	Valparaiso or Callao	18.00
Demerara	9.00@10.00	Marseilles	26.40@27.60

* Consignees paying dockage dues. ** Spanish dues for account. † 500 to 1,000 tons discharge.

[1] 500 tons discharge @ 30c. [2] 500 discharge. [3] And p.c. [4] Net, 1,000 tons discharge. [5] Or other good Spanish port.

W. W. Battie & Co.'s Coal Trade Freight Report.

COASTWISE FREIGHTS

While it is recognized that rates from Hampton Roads to Boston and Providence are receding the movement of boats has been so slow the past fortnight that very few bottoms have been offering. Two or three charters at $1.75 north of Cape Cod and $1.50 for points south are practically the only gauge on the freight market. No quotations are heard on season charters. 65@70c. continues the market on boats from New York to points on Long Island Sound, and practically all of the owners are insisting now on guaranteed days for loading and discharging. Enough demurrage has accrued in several cases to make the rate actually nearer $1.

OHIO VALLEY

PITTSBURGH

Transportation difficulties still very serious. Spot market rather dull and irregular. Little disposition to close contracts.

Neither producers nor consumers are very actively considering the matter of coal contracts for the period beginning Apr. 1, as the extent of wage scale concessions to the men remains in great doubt and neither party is disposed to act in the making of contracts. The spot market is dull and decidedly irregular in spots, according to changes in the transportation situation, the railroads placing and taking off embargoes almost overnight, while in many districts where there are no embargoes the movement is so irregular that the market is subject to great fluctuations. The railroads are making great efforts to relieve conditions, but shippers cannot see that any real progress is being made.

Considerable interest is manifested in the hearings begun in Washington this week before the Interstate Commerce Commission, upon the question whether railroads should be permitted to make rules, in extreme instances, against cars going off their lines. The railroads contend that if this power were given them they could improve conditions materially. Several weeks ago the Pittsburgh & Lake Erie made such a rule, as to certain classes of cars, the management apparently feeling it was better to dismiss the question of whether the proceeding was in strictly good form than to face the very serious embarassment that would be caused by further depletion of its supplies of cars.

There is practically no more disposition manifested on the part of consumers to stock coal in anticipation of a suspension of mining Apr. 1. Those who could not afford to take even a small risk have probably stocked a considerable tonnage. We quote prompt coal at the same level as a week ago, substantially as follows: Slack, $1.15@1.20; mine-run, $1.25@1.30; ¾-in., $1.35@1.40; 1¼-in., $1.50@1.60, per net ton at mine, Pittsburgh district.

BUFFALO

Bituminous quiet but cars scarcer than ever. Railroads congested. Not much buying in anticipation of an April shutdown. Anthracite moving well.

Bituminous—Shippers find the demand uncertain the car supply poor and the movement even worse. Sometimes it takes a week to get a car out of the city and sales are often lost on account of this. It appears that certain New England points bought heavily when the big shortage occurred and now have coal enough for several months. Consumption is large and does not appear to drop off, but the over-supply has brought down prices to about normal. This makes it difficult to sell Ohio coal here, as it has to depend on prices lower than is paid for Pittsburgh or Allegheny Valley grades. The Ohio product will soon return to the Lakes for an outlet, but in the meantime trade is dull westward. Changes in market conditions have been so extensive and sudden that the average consumer has not been able to understand them.

Following are city quotations on Pennsylvania bituminous, Ohio coal not forming the leading feature in the trade that it formerly did:

	Pittsburgh	Allegheny Valley	Penn Smokeless
Lump	$2.90	$2.65	$2.85
Three-quarter	2.75	2.50	.....
Mine run	2.65	2.40	2.65
Slack	2.25	2.20	2.65

All prices are per net ton, except east of Rochester and Kingston, Ont.

Anthracite—The trade is much improved, on account of the continued cold weather. While it is not expected that a normal amount of coal will be sold, taking the entire season together, the sales have been good enough of late to make a decided gain on the surplus. The demand for chestnut is still most active, while stove is dull and often accumulates.

Reports from the West show about a normal movement, and it is expected that the Lake Superior docks will be bare of coal when the spring Lake fleet gets there. There is some discounting done by the independent shippers and the trade generally is taking orders this month for May shipment. One shipper has some surplus stove which is being loaded into Lake vessels.

Following is the winter scale of prices, f.o.b., per gross ton:

	Cars	Vessels		Cars	Vessels
Grate	$5.60	$5.85	Chestnut	$6.10	$6.35
Egg	5.85	6.10	Pea	4.30	4.55
Stove	5.85	6.10	Buckwheat	3.25	3.50

TORONTO, CAN.

Market steady and active. Shortage of labor retards local deliveries. Yards well stocked but shipments delayed by congestion on railways.

Owing to continued severe weather the demand for anthracite is active. Local deliveries have been considerably interfered with owing to a shortage of labor, many teamsters having enlisted. Dealers have ample supplies on hand anticipating the possible closing down of the mines next month. The bituminous market is steadier with a normal demand, prices being well maintained.

Pennsylvania smokeless, which has recently been very scarce, is coming forward more freely and is in good demand. The movement of coal has been somewhat delayed by the congestion on the railways on both sides of the line. Quotations for best grades per short ton are as follows: Retail anthracite egg, stove and nut, $8; grate, $7.75; pea, 6.75; bituminous steam, $5.25; screenings, $4.50; domestic lump, $6. Wholesale f.o.b. cars at destination bituminous three-quarter lump, $3.75; screenings, $3.50; Pennsylvania smokeless lump, $4.50; Pocahontas lump, $5.50; slack, $3.75.

DETROIT

Moderately steady demand for the steam coals. Domestic grades helped by lower temperatures. Anthracite sluggish.

Bituminous—While steam consumers show little disposition to get supplies beyond immediate requirements, the buying continues regular with the demand steady and apparently well distributed. Fine coal is the most active though domestic grades were improved by cold weather at the close of last week. Consumers' buy sparingly, however, because, of the near end of the season. The retail dealers are holding off on renewal orders except where supplies are absolutely necessary.

There is considerable consignment coal in the market, but not sufficient to force sales at prices below schedule, though reductions are occasionally made.

Anthracite—Some householders were forced to put in additional supplies of anthracite, as a result of the low temperatures but in general the market is sluggish. There seems to be an adequate supply and despite unfavorable transportation conditions on coal roads in the east, deliveries are fairly prompt.

Lake Trade—Vessel owners have heard that the C. Reiss Coal Co. has closed contracts with some Cleveland fleets for delivery of 1,000,000 tons of bituminous coal at fast docks on Lake Michigan at a rate of 35c. a ton. The rate to be paid on anthracite has not been announced.

COLUMBUS

Trade spotty in both domestic and steam circles due to uncertainty over the wage scale. Contracting delayed pending a fixing of the new wage scale.

Because of the unfavorable weather and uncertainty concerning wage-scale negotiations, the coal trade has been rather quiet. Demand is small for this time of the year and there is not much life in any section. This condition is believed by many to be only temporary and a better demand is looked for in the near future.

Domestic trade is slow, as weather conditions have not been the best. Retailers have been buying from hand to mouth and are averse to increasing stocks at this time. The domestic trade is a weather proposition with the weather ranging from fair to bad. Retail trade is in small orders only as most of the larger users have their winter stocks. Rural dealers are unable to do much because of the bad roads. Retail prices are fairly firm, despite the unfavorable conditions.

Steam trade is quiet as contracting is now at a standstill, due to the wage negotiations now in progress. Many steam users believe there will be no suspension and are not stocking up as much as in previous years. It is believed by many coal men a suspension will take place before the wage scale is finally settled.

Anthracite prices are holding up well and there is considerable buying. Pocahontas is rather weak as has been the case for some time. West Virginia splints are in fair demand, but the car shortage is cutting off supplies from certain mining districts.

Prices in Ohio fields, f.o.b. mines per short ton, are as follows:

	Hocking	Pomeroy	Eastern Ohio	Kanawha
Re-screened lump	$1.60	$1.65	.....	.....
Inch and a quarter	1.50	1.50	$1.40	$1.50
Three-quarter-inch	1.35	1.40	.....	1.40
Nut	1.25	1.30	.....	1.25
Mine-run	1.15	1.15	1.05	1.10
Nut, pea and slack	.90	.95	.90	.90
Coarse slack	.80	.85	.80	.80

CINCINNATI

Severe weather has caused a small flurry in domestic. Steam grades remain strong, with nut and slack leading.

Continuous cold weather during the past week helped the domestic market to some extent, although the large supply in the hands of dealers prevented a heavy demand, as it has all season. Car service was also poor and this made it difficult to get coal in a few cases. The supply ranges from as low as 30% to as high as 80%, the usual run being three or four days a week. Steam consumers are being forced more and more to mine-run, which has strengthened this grade considerably, and may enable operators to get rid of a larger proportion of their output than might otherwise have been the case. Nut and slack continue the strongest grade in the market, however, and prices are in many cases just about the same as for mine-run of similar quality.

BIRMINGHAM

Commercial market quiet, but coking coals in heavy demand.

The market on commercial coal, both steam and lump, is very quiet, with no immediate prospects of any improvement. However, the larger companies using their own product, are working full capacity though are somewhat handicapped by the car shortage which has been felt for the past few days. The demand for coking coal is heavy, though the steam grades are easy. Blacksmith coal is in a satisfactory condition.

COKE

CONNELLSVILLE

Car supplies still short. Market developing for second half furnace coke. Production and shipments increased.

Car supplies in the Connellsville region were decidedly poor all last week, though not altogether as bad as in the fore part of February. The pressure became such that on Saturday $3.75 was paid for spot furnace coke, in small lots, while some operators were holding out for $4. This week will hardly see such high prices unless distinct shortages develop later, the week opening fairly well, as usual, as to car supplies. The market for foundry coke for spot shipment is decidedly irregular, some districts bidding higher than others.

while some operators that usually cater to this trade have no spot coke to spare.

Much earlier than usual interest has begun to develop in furnace coke contracts for second half shipment. The furnaces have sold their iron for second half, or can sell it at very good prices, and do not need to be particular about the precise price paid for coke. There are uncertainties, however, as to supplies, and so some of the furnacemen are taking an interest, and it understood that one or two contracts have virtually been closed. The whole coke market is stronger now than it was expected to be at this time, while the prospect of increased production of byproduct coke cutting further into the call for beehive coke has been pushed forward. Instead of a serious change in the situation in April or May it seems probable now that additional byproduct coke will not disturb matters materially before the fourth quarter at the earliest. Operators seem to have made up their minds that they should secure $3 or even higher on second half contracts, although practically all the contracts that were made for the year, some months ago were in the neighborhood of $2.25. We quote: Prompt furnace, $3.50@3.75; contract, $3@3.25; prompt foundry, $3.75@4; contract, $3.25@3.75, per net ton at ovens.

The "Courier" reports production in the Connellsville and lower Connellsville region in the week ended Feb. 26 at 445,260 tons, an increase of 26,973 tons, and shipments at 457,838 tons, an increase of 39,551 tons.

Buffalo—The coke trade is holding up much better than bituminous coal. While it is not at its highest the shippers mostly admit that it is higher than it should be and that only the car shortage holds it up to present prices. Some report is made of demand for domestic sizes of crushed coke, which sells about on a par with best Connellsville foundry, $5.85@6, with 48-hr. furnace $5.10@5.25. No genuine stock coke is offering.

Chicago—All grades of coke are strong. Furnace and foundry sizes are short, and current promise of future deliveries are two months ahead. The trend of quotations is upward. Prices per net ton of 2,000 lb. f.o.b. cars Chicago are as follows: Connellsville, $6.50; Wise County, $6.50; byproduct foundry, $6.25; byproduct domestic, $5@5.25; gas house, $4.75.

St. Louis—An increased movement of domestic sizes and a larger industrial consumption during this week has given a better tone to the market. Prices remain firm and are as follows, per net ton, f.o.b. cars St. Louis: Byproduct (all sizes), $5.25; gashouse (lump and egg), $4.50; petroleum (lump), $6.75.

Birmingham—The demand for furnace coke still continues brisk, and as there is no immediate prospect of curtailing the iron production it is only reasonable to suppose that the continued good market on coke will last for some time to come. The prices on furnace coke are from $2.75@3, with the demand equal to the production, very little stocking being possible on account of the heavy consumption. Foundry coke shows very little change recently, with a fair demand and prices around $4 f.o.b. ovens.

MIDDLE WESTERN

GENERAL REVIEW

Domestic sizes inclined to dullness. Warm weather restricts buying. Steam coals continue strong. Smokeless grades easier.

Milder weather has eased up the pressure on shippers, and sluggish conditions have generally prevailed during the past week, except on screenings, which are still strong, with the supply hardly equal to the demand. Some contracts on fine coal have been made this week at prices 10c. higher than last year and with the usual sliding scale predicated upon the new wage scale. Eastern slack contracts are being made at the same advance over last year's figures. On southern Illinois fine coals the contract basis will likely be 85c. a ton to the large consumers, and 90c. a ton on small tonnage. Predictions are freely made that contract prices for fine coal will be higher as the season advances.

Steam coals are not being taken as freely for storage purposes, especially the Eastern grades. Unbilled coarse domestic sizes are commencing to accumulate at some Indiana and Illinois mines, although this has had no effect on prices as yet. It is generally thought that the New York conferences will result in an amicable understanding, so far as Western bituminous interests are concerned, and this has tended to create a further depression. Retail buying is weak, and frequent cancellations of orders are noted. The favorable developments at the labor conferences have restricted storage operations and consumers apparently feel that they still have plenty of time to accumulate a reserve stock if a suspension should finally occur.

The opinion is freely expressed by several producers that there will be a shut-down at a great many mines after Apr. 1 because of the large amount of coal now in storage, irrespective of wage negotiations. It is apparent that the upper Lake docks will have their supplies exhausted by the end of March, and that Lake shippers will be in the market for a large amount of Eastern coals as soon as navigation is open. It is generally felt by the trade that an era of higher prices in Western territory is to come about next season, irrespective of wage negotiations.

CHICAGO

Unsold coarse coal accumulating at southern Illinois mines. Indiana domestic grades easier. Screenings stronger in Chicago market. Anthracite softer.

There has been an easing up in the demand for domestic sizes from southern Illinois mines, due to reduced orders from retail dealers. Steam sizes are very strong, the demand still exceeding the supply. Screenings are stiffer because of reduced lump production, and many inquiries are being received for future shipment. Williamson County mines have been shipping railroad coal largely. Shipments of mine-run from Saline County have been heavy with an excellent demand for steam sizes.

Light domestic buying from the Springfield district has been equalized by heavy shipments of steam sizes, screenings averaging 90c.

More than the usual amount of mine-run is being shipped from Indiana mines to Chicago for storage purposes. Movement of domestic grades is steady with no change in prices. Screenings from all districts are averaging from 90 to 95c., and the supply does not equal the demand. Railroad buying of storage coal continues without abatement.

The prepared smokeless sizes have been soft, and some lump and egg has been sold at concessions very near the mine-run price. Splint is in good demand, and some contracts have been made at prices above last year's basis. Pennsylvania smokeless has sympathetically declined with other Eastern coals, although but little tonnage has been offered. Open West Virginia smokeless mine-run shipments have been averaging around $1.25 to $1.35.

The Hocking market is flat. Kentucky coals are dull and weak; higher grades are being held around $2, but off qualities are moving at greatly reduced prices, block having been sold at as low as $1.65 in this territory.

Quotations in the Chicago market are as follows per net ton of 2,000 lb., f.o.b. cars mines:

	Williamson and Franklin Co.	Springfield	Sullivan	Clinton	Knox and Greene Cos.
Lump	$1.60@1.75	$1.50@1.75	$1.50@1.65	$1.60@1.75	$1.40@1.50
Steam lump	1.35	1.25@1.35	1.25@1.30	1.25@1.30	....
2½ and 3-in. lump	....	....	1.35@1.40	....	1.30
1½-in. lump	....	....	1.30@1.35	1.25@1.30	....
Egg	1.50@1.75	1.45@1.60	1.20@1.30	1.40@1.50	1.40@1.50
Nut	....	1.35@1.60	1.15@1.20	1.25@1.35	1.15@1.25
No. 1 washed	1.50@1.75	....	1.50	....	....
No. 2 washed	1.40@1.50	....	1.40	....	....
No. 1 nut	1.60@1.75	....	....	....	....
No. 2 nut	1.50@1.60	....	....	....	....
Mine-run	1.20@1.25	1.15@1.25	1.00@1.10	1.10@1.15	1.05@1.10
Screenings	.95@1.00	.85@ .90	.85@ .90	.85@ .95	.95

	Harrisburg & Saline Co.	E. Kentucky	Pocah. & W.Va.Smok'l.	Penna. Smokeless	Hocking
Lump	$1.50@1.75	$1.65@2.35	$1.50@1.75	$1.60@1.75	$1.65@1.85
1½-in. lump	1.30@1.35	....	....	....	1.40@1.50
Egg	1.50@1.75	1.40@2.00	1.50@1.75	1.60@1.75	1.15@1.25
Nut	....	1.25@1.40	1.50@1.65	1.50@1.75	....
No. 1 nut	1.50@1.75	....	....	....	....
No. 2 nut	1.40@1.60	....	....	....	....
Mine-run	1.25	1.10@1.20	1.25@1.40	1.25@1.40	1.10@1.15
Screenings	.90@1.00	.80@ .85	....	....	.85@1.15

ST. LOUIS

Some improvement due to the colder weather. Screenings strengthen. Car supply short.

A return of snow and colder weather, while not advancing prices for the coarser sizes, has caused an improved demand. Standard and Intermediate grades of lump and egg are moving in better volume. The influx of domestic orders is the chief cause for the betterment, though steam consumption has increased to some extent. No. 2 nut is in fairly good demand. Screenings particularly are stronger and are selling readily at 5 to 10c. per ton higher with a better general demand. All sizes of washed coal are taken up and the smaller sizes appear to be sold well ahead at good prices.

Southern Illinois domestic sizes while not sold far ahead, continue to move in sufficient volume to avoid any accumulation at the mines. Incoming orders for No. 1 nut prodominate slightly. Screenings continue scarce and remain at top prices. The smaller sizes of washed are in active demand and are scarce.

In the Standard district operation of the mines has been on the basis of three to five days per week, while all of the other fields have been enjoying full time.

Aside from the few industries storing screenings against a possible strike or certain scarcity in the event of no strike, no storage coal worthy of mention is moving.

The following prices, per net ton, prevail f.o.b. cars at mines:

	Williamson and Franklin	Staunton and Mt. Olive	Montgomery Co.	Intermediate	Standard
8-in. lump..	.....	.....	.....	$1.20@1.50	$1.10@1.25
6-in. lump..	$1.50@1.75	$1.25@1.50	$1.25@1.50	1.20@1.50	1.10@1.25
3-in. lump..	1.50@1.75	1.25@1.40	.....	1.20@1.50	.....
2-in. lump..	1.40@1.50	1.15@1.25	.....	1.15@1.25	.95@1.10
1½-in. lump.	1.40@1.50	.....	1.20@1.35	1.10@1.25	.90@1.10
6x3-in. egg..	1.50@1.75	.....	1.25@1.50	1.20@1.50	1.10@1.25
6x2-in. egg..	.....	.....	1.20@1.35	1.15@1.25	.90@1.10
6x1½-in. egg	1.40@1.50	.....	1.20@1.35	1.10@1.25	.90@1.10
No. 1 nut..	1.30@1.50	.....	1.25@1.40	1.10@1.25	.90@1.10
No. 2 nut..	1.25@1.40	1.00@1.15	.....	.90@1.10	.90@1.05
Mine run...	1.10@1.15	1.10@1.15	1.10@1.15	1.05@1.15	.90@1.00
Screenings..	.90@1.00	.75@ .90	.75@ .90	.65@ .80	.65@ .80
Washed					
No. 1 nut..	1.60@1.75	1.50@1.60	.....	1.50@1.60	1.50@1.60
No. 2 nut..	1.50@1.60	1.25@1.40	.....	1.25@1.40	1.25@1.40
No. 3 nut..	1.50@1.60	1.20@1.30	.....	1.20@1.30	1.25@1.30
No. 4 pea..	1.50@1.60	1.15@1.25	.....	1.15@1.25	1.15@1.25
No. 5 slack.	.90@1.00	.75@ .85	.....	.75@ .85	.75@ .85

DULUTH

Demand well maintained. Cold weather helps the trade and stocks of screenings are being rapidly depleted.

The demand for all grades of bituminous coal was well maintained during the past week and dock operators advise the receipt of a large number of orders for shipment to interior points. Colder weather throughout the Northwest has caused much activity in dock shipping circles, especially in the retail and domestic trade. Stocks of screenings are being rapidly exhausted and a shortage is anticipated. Companies having free coal are now receiving a premium. Quotations per short ton, f.o.b. cars at Duluth docks, are as follows:

	Yough	Splint	Hock	Smokeless	Elkhorn
Lump.....	$3.40	$3.40	$3.40	$5.00	$3.75
Dock run.....	3.10	3.10	3.05	3.25	3.25
Egg, stove and nut	3.40	3.40	3.40	5.00	3.65
Screenings.....	2.50	2.50	2.25	2.75	2.55

Anthracite is quoted as follows, f.o.b. cars per short ton at Duluth docks: Nut, $7.10, stove and egg, $6.85; pea, $5.55, and buckwheat, $4.

PRODUCTION AND TRANSPORTATION STATISTICS

NORFOLK AND WESTERN

Destination of shipments over this road for December and January of last year and this year were as follows, in short tons:

	December		January	
Coal	1914	1915	1915	1916
Tidewater, foreign.....	108,820	220,434	104,250	186,495
Tidewater, coastwise.....	255,138	239,289	260,551	353,960
Domestic.....	1,277,207	2,047,159	1,522,137	2,148,334
Coke				
Tidewater, foreign.....	1,076	7,638	414	3,628
Domestic.....	71,999	113,051	69,801	152,720
Total.....	1,714,240	2,627,571	1,957,153	2,845,137

COAL MOVEMENT

Fuel shipments over 13 of the leading Eastern carriers for November and preceding three months of 1914 and 1915, were as follows, in short tons:

	August		October		November	
Anthracite	1914	1915	1914	1915	1914	1915
B. & O.....	84,737	81,436	127,394	173,613	126,769	139,416
B. R. & P....	7,362	5,635	12,324	14,281	13,137	14,170
B. & Susq...	673	379	939	1,175	1,120	1,282
C. & O.....	1,866	1,807	1,289	1,734	1,229	1,122
Erie.....	872,357	802,059	953,416	914,736	731,066	914,850
H., B. T. M.	.....	.....	.....	111	3	101
Penn.....	795,492	743,257	1,047,340	1,084,739	1,003,988	1,194,794
P. & L. E....	.....	41	94	152	94	241
P. S. & N....	567	221	771	971	1,735	1,619
Virginian...	331	84	61	163	166	191
W. Md.....	24,647	26,471	25,008	40,217	28,445	35,213
Total....	1,788,032	1,661,390	2,168,636	2,231,892	1,908,652	2,302,999
Bituminous						
B. & O.....	2,922,802	3,181,407	2,802,702	3,312,195	2,452,786	3,016,640
B., R. & P..	798,967	648,087	648,915	803,521	598,648	861,540
B. & Susq...	119,612	93,813	94,871	115,030	88,058	150,899
C. & O.....	2,104,217	2,236,625	2,026,589	2,175,256	1,556,469	2,141,243
Erie.....	635,310	545,868	494,830	818,701	538,258	824,975
H., B. T. M.	80,215	82,353	84,785	120,951	81,794	126,609
N. Y. C.[1]...	441,633	529,251	534,708	656,025	458,917	688,612
N. & W.....	2,218,544	2,762,018	1,757,198	2,753,601	1,627,678	2,433,977
Penn.....	4,074,810	3,847,575	3,976,192	4,304,466	3,446,436	4,307,041
P. & L. E...	1,063,989	975,727	834,940	1,207,533	609,350	1,081,860
P. S. & N....	164,412	183,428	192,449	300,501	213,206	291,920
Virginian...	346,266	392,694	322,810	339,820	261,530	332,635
W. Md.....	599,594	820,115	563,617	847,598	521,871	849,587
Total....	15,560,371	16,298,961	14,334,606	17,755,196	12,455,001	17,107,538

Totals	1914	1915
July.....	19,733,551	21,256,963
August.....	21,033,187	22,654,992
September.....	20,852,005	23,304,404
October.....	20,102,017	25,389,954
November.....	17,786,614	24,600,533
Total, 5 months.	99,507,374	117,206,846

[1] Buffalo and East.

[2] Totals do not include amounts for coal received by the N. Y. C. R.R. from connections.

Note—The Southern Ry. transported 282,881 short tons of bituminous coal in November, 1914, and 330,946 short tons in November, 1915.

BALTIMORE & OHIO

The following is a statement of coal and coke tonnage moved over this system and affiliated lines during January and the previous two months:

	November		December		January	
	1915	1914	1915	1914	1916	1915
Coal.....	2,869,287	2,324,271	2,805,803	2,227,899	2,707,785	2,293,406
Coke.....	375,014	185,466	377,511	232,594	382,692	221,395
Total....	3,244,301	2,509,737	3,183,314	2,460,493	3,090,477	2,514,801

FOREIGN MARKETS

GREAT BRITAIN

Feb. 23—Conditions for prompt loading show some irregularity because of the shortage of ready tonnage. The general outlook is not very favorable on account of the extreme difficulty in obtaining tonnage for early March loading. Quotations are approximately as follows:

Best Welsh steam.....	Nominal	Best Monmouthshires....	$8.52@8.64
Best seconds.....	Nominal	Seconds.....	8.40
Seconds.....	$8.40@8.64	Best Cardiff smalls.....	4.80
Best dry coals.....	8.76	Cargo smalls.....	3.12

The prices for Cardiff coals are f.o.b. Cardiff, Penarth or Barry, while those for Monmouthshire descriptions are f.o.b. Newport, both net, exclusive of wharfage.

Freight—The inquiry is active but tonnage is very scarce and rates are strengthening further. Rates are approximately as follows:

Gibraltar.....	$9.48	Naples.....	$15.88	St. Vincent.....	$10.44
Marseilles.....	11.37	Alexandria.....	19.20	River Plate.....	10.80
Algiers.....	14.47	Port Said.....	19.20		
Genoa.....	15.88	Las Palmas.....	9.60		

Exports—British exports for December and January of the past three years were as follows:

	December			January		
To	1913	1914	1915	1914	1915	1916
Russia.....	400,315	.....	.....	239,004	.....	.....
Sweden.....	379,522	291,039	171,787	286,488	262,936	123,227
Norway.....	201,951	179,562	185,518	217,682	210,335	170,055
Denmark...	294,685	225,520	216,165	246,017	208,784	193,811
Germany...	655,841	.....	.....	553,433	.....	.....
Netherlands	148,598	90,634	137,915	127,412	131,378	110,617
Belgium....	140,761	1,008	.....	178,849	.....	.....
France.....	1,099,553	1,246,786	1,386,299	1,235,642	1,383,961	1,347,586
Portugal[1]...	129,485	84,853	84,403	130,778	69,934	93,685
Spain[4].....	293,858	148,132	158,046	345,621	159,350	199,023
Italy.....	802,488	759,477	382,496	790,605	469,885	424,680
Aus. Hung..	78,728	.....	.....	72,842	.....	.....
Greece.....	61,042	44,594	.....	46,291	23,588	1,453
Roumania..	25,722	.....	.....	8,334	.....	.....
Turkey.....	61,951	.....	.....	40,219	.....	.....
Algeria.....	107,169	53,649	93,011	131,274	99,227	87,811
Portugal[5]..	19,187	25,732	18,070	20,911	9,437	16,728
Chile.....	46,525	2,933	119	35,398	5,224	267
Brazil.....	155,208	75,216	28,462	118,531	66,484	31,445
Uruguay...	66,143	9,385	32,998	56,523	49,692	30,007
Argentine..	380,859	194,499	163,606	354,770	178,600	158,231
Channel Is..	14,636	9,051	14,007	12,031	7,340	12,401
Gibraltar...	33,703	34,835	21,817	32,481	30,269	34,036
Malta.....	78,622	4,925	18,740	35,686	11,316	9,706
Egypt[2].....	358,847	177,511	130,738	315,182	149,665	83,913
Aden[3].....	26,664	4,004	5,104	12,079	10,254	.....
India.....	27,189	7,054	50	1,837	8,925	7,886
Ceylon.....	26,115	5,495	.....	38,539	6,604	5,750
Miscell'ous.	114,088	22,980	37,891	110,311	59,775	34,882
Coke.....	118,619	107,442	101,168	124,256	92,597	112,809
Briquettes..	178,235	73,077	81,826	169,945	64,038	99,030
Total....	6,526,307	3,879,393	3,470,236	6,088,971	3,769,598	3,383,099
Bunker.....	1,842,006	1,248,215	953,878	1,731,012	1,377,081	1,069,244

[1] Includes Azores and Madeira. [2] Including Anglo-Egyptian Sudan. [3] And dependencies. [4] And Canaries. [5] West Africa.

Note—The figures in the above table do not include Admiralty and certain other shipments.

ARGENTINA

The foreign trade department of the National City Bank of New York has received a cablegram from Buenos Aires stating that the coal imports of Argentina were 2,500,000 tons in 1915, of which 652,000 tons were from the United States. In 1914 there were 3,422,000 tons imported, with 170,000 from the United States. In making the announcement the department says:

"Thus, in a year when Argentina's coal imports have shrunk 27%, nearly four times as much United States coal has gone in as before, the proportion of United States coal to all that imported rising from a little less than 5% to 38%.